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OPTICAL CONSTANTS OF BORON CARBIDE

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ABSTRACT

The optical constants n and k have been determined in the 700 - 1200 cm^{-1} wavenumber region for a boron carbide flat of compressed 2 micrometer diameter particles by the polarized reflection method. A broad absorption band has been found near 1050 cm^{-1} , where k reached values of 1 to 2 and n of lower than 1.5. The scatter of the data points was large, probably because of the demonstrated presence of up to 10% of iron oxide on the surfaces (by SEM/X-ray).

More accurate procedures are suggested for future work. The suspension of the particles in one arm of a Michelson interferometer is probably the most direct and superior method for obtaining n and k for such particles.

I. INTRODUCTION

Boron carbide has been suggested as a material suitable for obscuration against thermal imaging. Early work by Brame¹ and coworkers, using the KBr disk dispersion method, showed a broad absorption band near 9.5 μm and a weak band near 12.5 μm , the former band overlapping one of the CO_2 laser bands (9.6 μm). It has been shown that obscuration by small absorbing particles is more effective than general absorption and scattering by an aerosol spray.

The obscuration characteristics of a powder depend on the complex index of refraction at the required wavelengths in the atmospheric window, which is 8 - 14 μm in the mid-infrared, and on particle size, shape and concentration. However, the two parts of the complex index, the real and the imaginary part, which are the optical constants n and k , themselves depend on particle size and shape and -- to make things even more complicated -- are not independent of each other. The pragmatic way of measuring these quantities and their interrelation, namely by field trials, is costly and not really practical, since different conditions and their interactions would require exploration. The closest laboratory simulation of field conditions would seem to be dispersion of the powder in one arm of a two-beam interferometer and comparison with a reference phase and intensity. Stabilization of the powder as an aerosol should not be too difficult to obtain. This method was given much thought, but was not applied because enough time on our infrared interferometer was not available. This was unfortunate, because the data so obtained would have been applicable to the problem at hand with only a minimum of theoretical interfacing.

Next in line of sophistication appeared to be Brame's method, already referred to, i.e. the determination of transmittancy through KBr disks in which boron carbide powder is dispersed. Huffman² recently advanced this procedure to make it more pertinent to the obscuration problem. Our experience with the KBr technique in an analytical laboratory warned us of a number of difficulties, such as nonuniform dispersion, accumulation of impurities, especially water, at interfaces, particle size and concentration effects, etc. Huffman has been able to minimize these difficulties by careful attention to detail.

Given the various restrictions and our desire to make a beginning in this study, we decided on using the polarized reflectance method with a polished plate of compressed boron carbide. This was not the procedure we had originally proposed, but we thought it would--and, in fact, it did--give us better insight into the overall problem and provide some preliminary data. It would then become the basis for an adaptation of the interferometer method at some later time.

II. MATERIAL

Boron carbide is heterotropic; however, it is not too far from being isotropic, being hexagonal and rhombohedral, so that a diamond-polished compressed and sintered disk should present an average and representative surface. The Norton Company supplied us with a 5mm thick plate, which was cut with a diamond saw to 10mm x 10mm square. The large surfaces were diamond-turned to a flatness and polish of better than 1 μ m. A specimen was coated by evaporation with a thin layer of gold and examined under the scanning electron microscope (SEM). Figure 1 shows a representative picture at a magnification of 1000X. This picture was obtained with back-scattered electrons, since this mode showed more detail. The lighter particles amounting to about 10% of the areas studied turned out to contain significant amounts of iron (by X-ray scattering built into the SEM). The surface concentration of iron is thus much above the bulk concentration given by Norton as 0.5 - 0.9%.

The bulk density of the specimen was only 1.2 g/ml--whereas the particle density (by Norton) is a 2.5 g/ml. Accordingly the reflectivities of such a surface, assuming uniform porosity should be increased by a factor of two. However, nothing in the electron photomicrographs would indicate the need for such a correction. Perhaps the "black holes" were filled in during the polishing operation. Furthermore, as will be shown, such high reflectivities could not be reconciled with possible optical constants.

III. APPARATUS

The instrument used for the reflectance measurements was a Model 221 Perkin-Elmer double-beam grating spectrophotometer with a Harrick reflectance adapter (VRA and VARA) containing a mirror system automatically equating angles of incidence and reflection. The optics is shown in Figure 2. The original plan was to use internal reflection with the germanium hemicylinder, according to the arrangement of Figure 2a. Considerable effort was spent on making good contact between the flat germanium surface and the boron carbide surface. It did not work. To convince ourselves that our unit functioned properly we duplicated Robinson and Price's³ work on teflon and experienced no difficulty. Admittedly, we avoided exerting much pressure to force the boron carbide and germanium surfaces against each other for fear of breakage. By contrast, teflon would flow under pressure. Given more time, a liquid of suitable index of refraction could have been used as an interface, perhaps on a KRS-5 hemicylinder instead of a germanium hemicylinder. The latter material was not available, however, and the selection of a fluid (no absorption bands in the pertinent wavelength region and an index of refraction equal to that of KRS-5) would have had to be done with care. For internal reflection--it will be recalled--the refractive index of the hemicylinder must always exceed that of boron carbide. Thus, reluctantly, internal reflection--the procedure most successfully used for the determination of the optical constants of liquids by Crawford and coworkers⁴--had to be abandoned and specular reflection used instead.

Two principal difficulties were noted with the specular reflection arrangement: (i) Since the focus had to be located at the boron carbide

surface, there had to be some angular spread. It was about ± 2 degrees. The angular sensitivity was thus reduced. (ii) The area illuminated would vary with angle since the focal image on the boron carbide surface was not just a "point". We therefore took pains to measure a standard gold surface in exactly the same way as the boron carbide surface. However, large angles of incidence turned out to be very difficult to handle for this reason and very small angles could not be accommodated by the Harrick design. Our range of angles of incidence was therefore limited to 40° - 60° . For this reason we chose to vary the plane of polarization at a fixed angle for the optical constant determinations, rather than the angles of incidence.

The polarizer used was purchased from Cambridge Instruments of England. It consists of a one-inch diameter disk of KRS-5 containing aluminized parallel wires $0.4 \mu\text{m}$ apart. It therefore covers the entire midinfrared range with an efficiency of better than 95%. The theory of parallel wire polarizers shows that radiation, whose electric vector is in a plane perpendicular to the direction of the wires, is transmitted.

Since the spectrophotometer is a double-beam one designed for absorption spectroscopy, it is necessary to have either an identical reflectance adapter in the reference beam or an attenuator to compensate for the radiation loss in the adapter. The latter course was chosen to avoid the high cost of another adapter. The attenuator used was made by Research and Industrial Instruments Corporation of London, England. It consists of a stationary and a rotating comb of variable position and a screen holder accommodating screens of different mesh size. Calibration of the screens and the angular positions was accomplished by placing the attenuator into the sample beam and comparing it with the unobstructed reference beam.

Originally the two beams were adjusted to be of equal strength. Differences on account of the attenuator could be directly converted to "fraction transmitted".

Since the instrument was designed for absorption spectrophotometry, the chart paper is marked in a logarithmic manner, recording the "absorbance" (base-10 logarithm of the reciprocal of the fraction of incident radiation transmitted at the sample side). The procedure of handling the data will be shown in the following section.

IV. EXPERIMENTAL PROCEDURE

The attenuator and screens were calibrated for various openings, i.e. "absorbances" were determined for them. The reflection adapter was placed in the sample position of the spectrophotometer and aligned for optimum signal output according to the directions of the manufacturers. A gold surface was placed at the focal position (Figure 2). The appropriate attenuator screen and position was selected to permit adjustment of the scale to a reading of zero absorbance (100% transmittance, in this case 100% reflectance) at the wavenumber of maximum signal strength. Since the instrument was thus working at a lower level of radiation and therefore at a lower signal/noise ratio than is normal, the time constant and the scanning time had to be increased considerably. The wavenumber region from 1200 to 700 cm^{-1} was scanned, using a standard slit program. The run was repeated with the polarizer in the beam, both with the plane of polarization in the plane of incidence and with the plane of polarization at right angles to the plane of incidence.

Then the boron carbide surface was exchanged for the gold surface and the same three scans (unpolarized, polarized \perp , and polarized \parallel) were performed. Since boron carbide reflected less of the incident beam than gold (whose reflectivity was assumed to be unity), it was necessary to place different screens into the attenuator and to change the angular position of the combs from what they were with the gold surface. The reflectivity of boron carbide relative to that of gold was calculated from the equation

$$A_{BC} = A_{BC}^R + A_{BC}^S - A_{Au}^R - A_{Au}^S \quad (1)$$

and

$$R_{BC} = 10^{-A_{BC}} \quad (2)$$

where

- A_{BC} = apparent absorbance of the boron carbide surface
- A_{BC}^R = absorbance reading for the boron carbide surface
- A_{BC}^S = absorbance of the attenuator and screens used with the boron carbide scan
- A_{Au}^R = absorbance reading for the gold surface
- A_{Au}^S = absorbance reading of the attenuator and screens used with the gold surface scan

Prior to every scan the surface was cleaned with distilled water and acetone and the mirrors realigned. Slight changes of mirror angles were inevitable whenever the specimen holder was removed and re-inserted. Every scan was repeated; reasonable duplicates were obtained ($\pm 10\%$ of absorbance reading). The scanning time for the $1200 - 700 \text{ cm}^{-1}$ wavenumber range was about two hours. Scans were made at several angles by incidence, but $40 - 60^\circ$ gave the most consistent results. A consistency check was carried out at an angle of incidence of 45° degrees; as Berreman⁵ has shown the $R_{||}$ and R_{\perp} reflectances should then be equal.

V. DATA PROCESSING

The Fresnel equations which express the reflecting power of a given substance as a function of the optical constants, n and k , and θ , the angle of incidence, can be written as follows:

$$R_s \equiv R_{\perp} = \frac{(\cos \theta - E)^2 + F^2}{(\cos \theta + E)^2 + F^2} \quad (3)$$

$$R_p \equiv R_{\parallel} = \frac{(A \cos \theta - E)^2 + (G \cos \theta - F)^2}{(A \cos \theta + E)^2 + (G \cos \theta + F)^2} \quad (4)$$

where $A = n^2(1 - k^2)$

$$E = \left[\frac{A - \sin^2 \theta + \frac{(A - \sin^2 \theta)^2 + 4n^4 k^2}{2}}{2} \right]^{1/2}$$

$$F = \left[\frac{[(A - \sin^2 \theta)^2 + 4n^4 k^2]^{1/2} - A + \sin^2 \theta}{2} \right]^{1/2}$$

$$G = n^2 k$$

and the ratio of refractive indices is given by equation (5)

$$n = n_2/n_1 \quad (5)$$

where the subscript 1 refers to the incident medium and the subscript 2 refers to the medium under investigation. In the case of internal reflection n_1 is a function of wavelength; in the case of external reflection medium 1 is air or vacuum and $n_1 = 1$. It is assumed that k_1 (the attenuation index of the incident medium is zero so that k_1 (the attenuation index of the incident medium is zero so that k above is k_2 .

Furthermore

$$R = \frac{1}{2}(R_s + R_p) \quad (6)$$

The above equations are given in the form they were written down by Rusch, Koehler and Labowski⁶, with one important exception: Wherever these authors wrote $n^2 k^4$ and nk^2 , we substituted $n^4 k^2$ and $n^2 k$. Checking through the complete derivations showed us that these errors were made.

We then had these equations calculated and plotted according to Simon's⁷ method for every 10° degrees change of angle of incidence between 0° and 90°, using the computer program of Appendix I. Figures 3 show the plots. Plots for other angles of incidence can be obtained from the program.

The Fresnel equations are functions of three variables; however, once an angle of incidence has been fixed the equations contain only two unknowns, n and k . Thus several experimental methods are suggested, e.g. (1) R_s at θ_1 and θ_2 , (2) R_p at θ_1 and θ_2 , (3) R_s, R_p at θ , (4) R, R_s at θ As mentioned earlier, it turned out that the last method was easier since the specimen area illuminated could be kept constant. However, the other methods were also tried.

The graphs can be used with any of these methods. Only one combination of n and k will fit two graphs, e.g. R_s vs n at a given θ , simultaneously.

For method (3), Heilmann⁸ and Abel's⁹ have shown an explicit solution for n and k , for $k < n$, viz.

$$n = \sqrt{\frac{1}{2} (z - w + \sqrt{2z \sin^2 \theta + w^2})} \quad (7)$$

$$k = \sqrt{\frac{1}{2} (-z + w + \sqrt{2z \sin^2 \theta + w^2})} \quad (8)$$

or less directly,

$$n^2 - k^2 = z - w \quad (9)$$

$$n^2 + k^2 = \sqrt{2z \sin^2 \theta + w^2} \quad (10)$$

Here w and \sqrt{z} are obtained from

$$w = \tan^2 \theta \cdot \frac{\mu - 1}{\tan^2 \theta - \mu}, \quad \sqrt{z} = \frac{\tan^2 \theta - 1}{\sqrt{z} \cdot \cos \theta} \frac{\sigma}{\tan^2 \theta - \mu}$$

$$\text{where } \mu = \frac{R_s - R_p}{R_s + R_p} \cdot \frac{1 + R_s}{1 - R_s} \text{ and } \sigma = \frac{R_s - R_p}{R_s + R_p}$$

These relations are also consistent with the Kramers-Kronig equations relating n and k .

We found it easier to use the graphic method first and then check the results by the analytic expressions, even for the R_p, R_s, θ method, since no errors are allowed by the analytic expressions. Furthermore, in our case the simplifying assumption, $k < n$, was not generally true.

VI. RESULTS

Figures 4 and 5 show n and k as obtained by the Robinson-Price method, i.e. from R_p , R_s , and R , using the plots of Figure 3 and graphical matching. The results appear to be reasonable for the frequency region. The scatter of the points is appreciable, but a wide absorption peak near 1050 cm^{-1} is clearly shown. Hence the behavior of k is reasonable. The refractive index values (n) are consistent between Figures 4 and 5, within our limits of error, but the expected initial rise of n did not come out of the curve fitting, although some high values were observed. An earlier set of data plots obtained for a different angle of incidence (Figure 6) did show the rise (by just two points), but also showed the dip and the dip more clearly. Figure 7 shows the reflectivities from which these data were calculated.

The scatter of the points may have a number of reasons, but the non-uniformity of the surface (Figure 1) caused largely by the patches of iron oxide could be the principal factor.

We found the graphical method was preferable over direct computation largely because of the scatter of the points.

VII. DISCUSSION

The limitations of the reflection method are quite clear as the comparison given by Huffman¹⁰ has shown. An "absorption" spectrum of a KBr disc containing suspended particles of a very limited size range appears to be more direct. This author is, however, well aware of many difficulties of the pressed KBr technique in quantitative infrared spectroscopy and some of them would seem to be applicable here as well. As our SEM/X-ray measurements have shown contaminants prefer to accumulate at interfaces. The interface area of suspended particles is extremely large. Infrared-invisible contaminants may affect the scattering characteristics of other material.

We tried to correct for the differences between bulk and particle densities by assuming a proportion of "black" holes on the reflecting surfaces. However, it turned out to be impossible to get consistent results. Judging from the SEM photos, it would seem that the holes were "filled in" in the polishing operation.

VIII. SUGGESTED FURTHER WORK

This report section was long delayed because we far exceeded the allotted funds (\$6000 for two different areas of work, this being one of them) and yet were intrigued by the problem sufficiently to look for better approaches. However, unallocated time was hard to find on our instrumentation. For example, substitution of a boron carbide surface (a diamond-turned, laser-quality surface) for part of the stationary mirror in a Michelson interferometer would be a more direct procedure to obtain phase changes on reflection and thus the optical constants (Parker et. al.¹¹). However, the most direct approach to the problem at hand would seem to be the filling of one arm of the Michelson interferometer with the boron carbide dust. An analogous procedure has been used to get accurate absorption spectra of gases at low pressure.

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Figure 1 Scanning Electron Microscope photograph of Boron carbide plate. (1000 X)

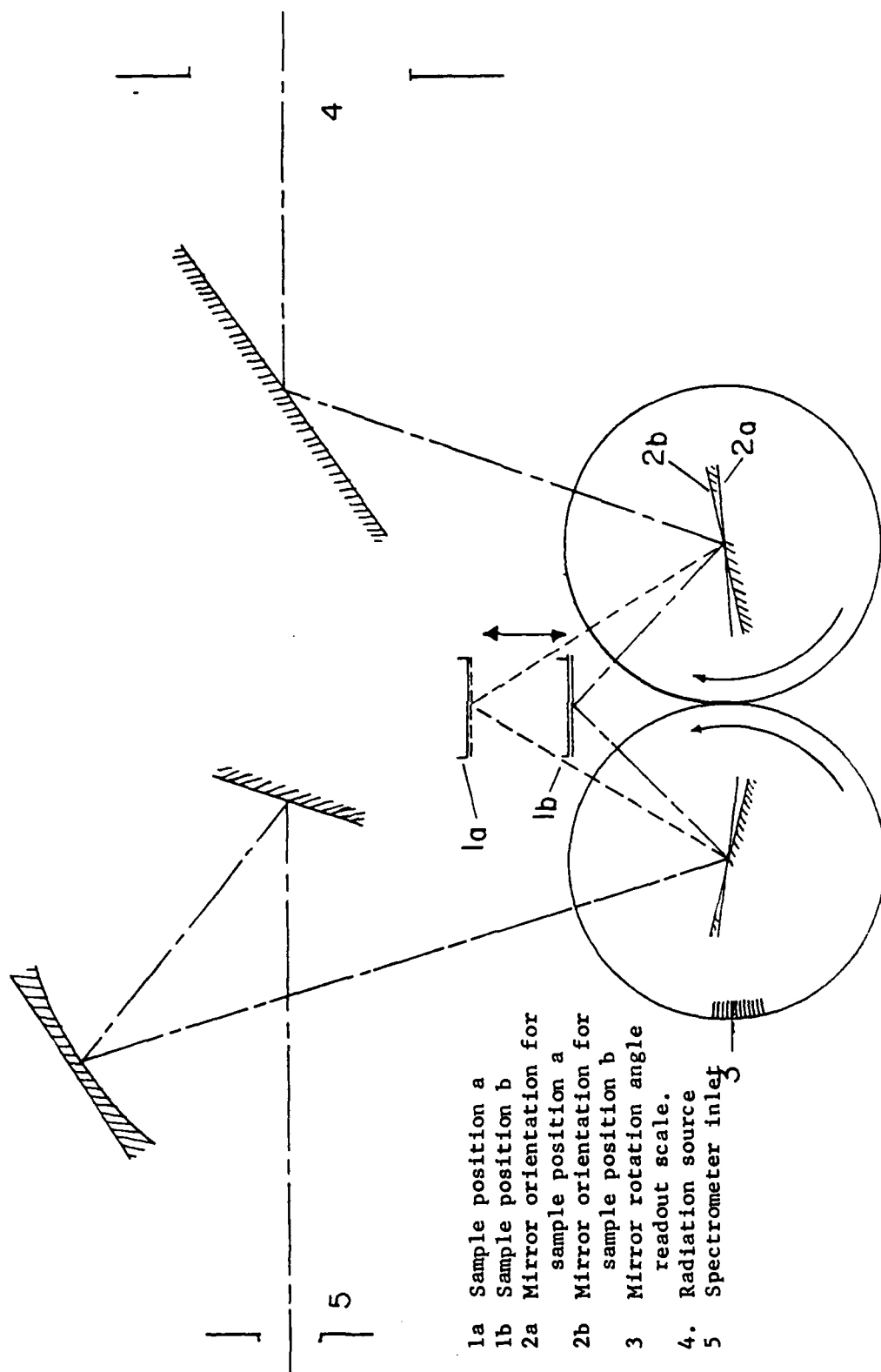


Figure 2b Adapter to infrared spectrophotometer for reflectance measurements

- a. Internal reflection by the germanium hemicylinder method
- b. Specular reflection method

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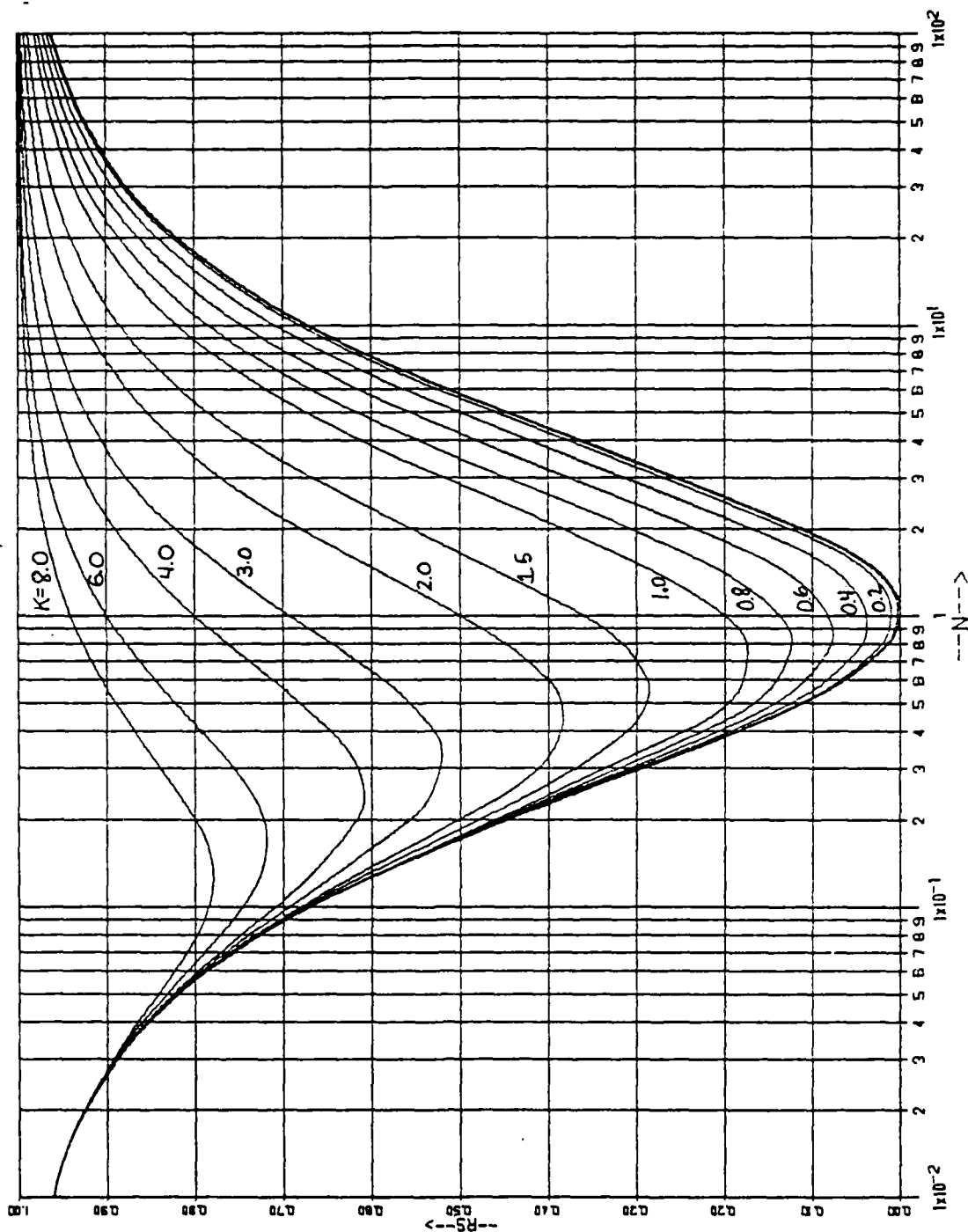


Figure 3.1.1 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 0° degrees.

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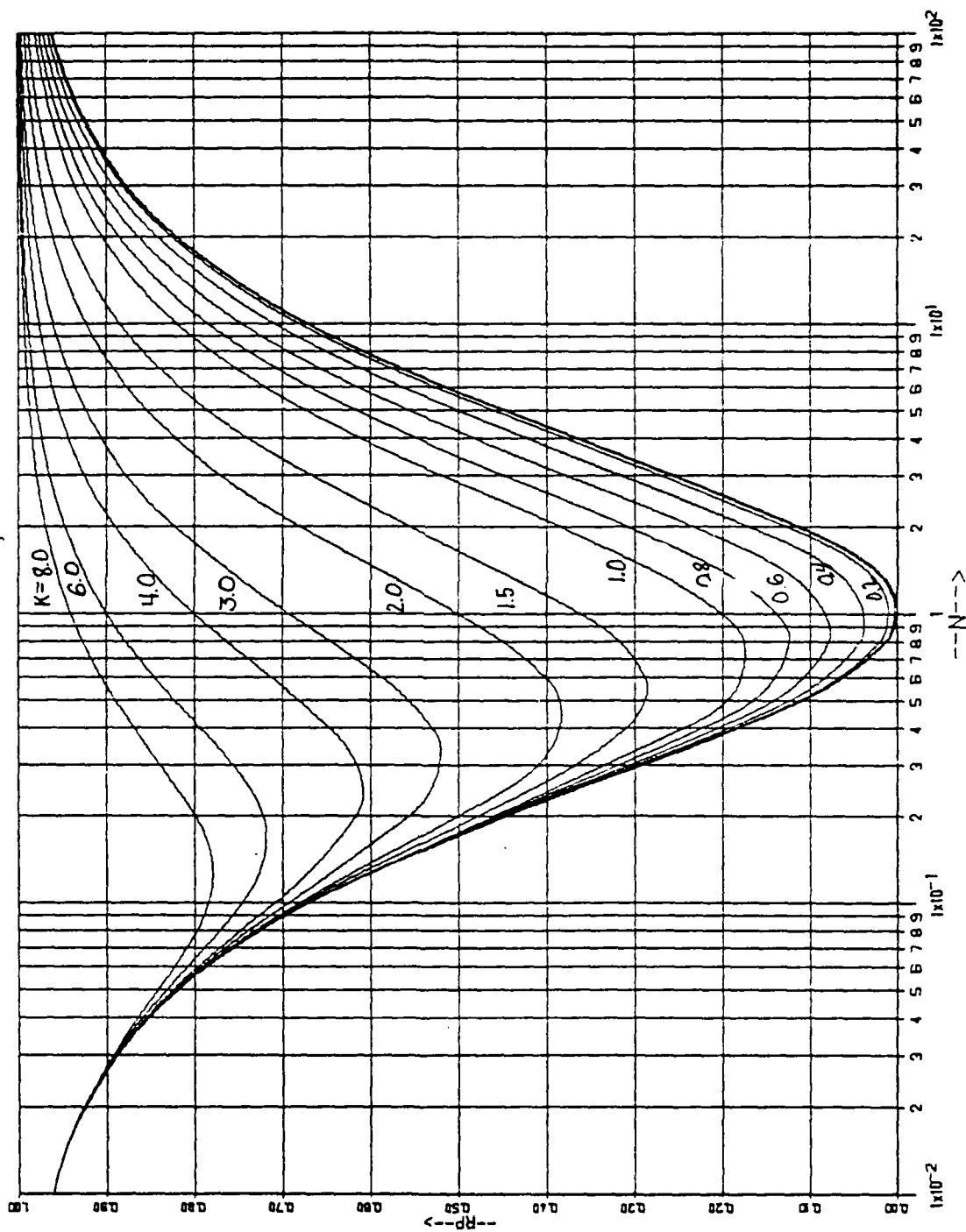


Figure 3.1.2 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 0° degrees.

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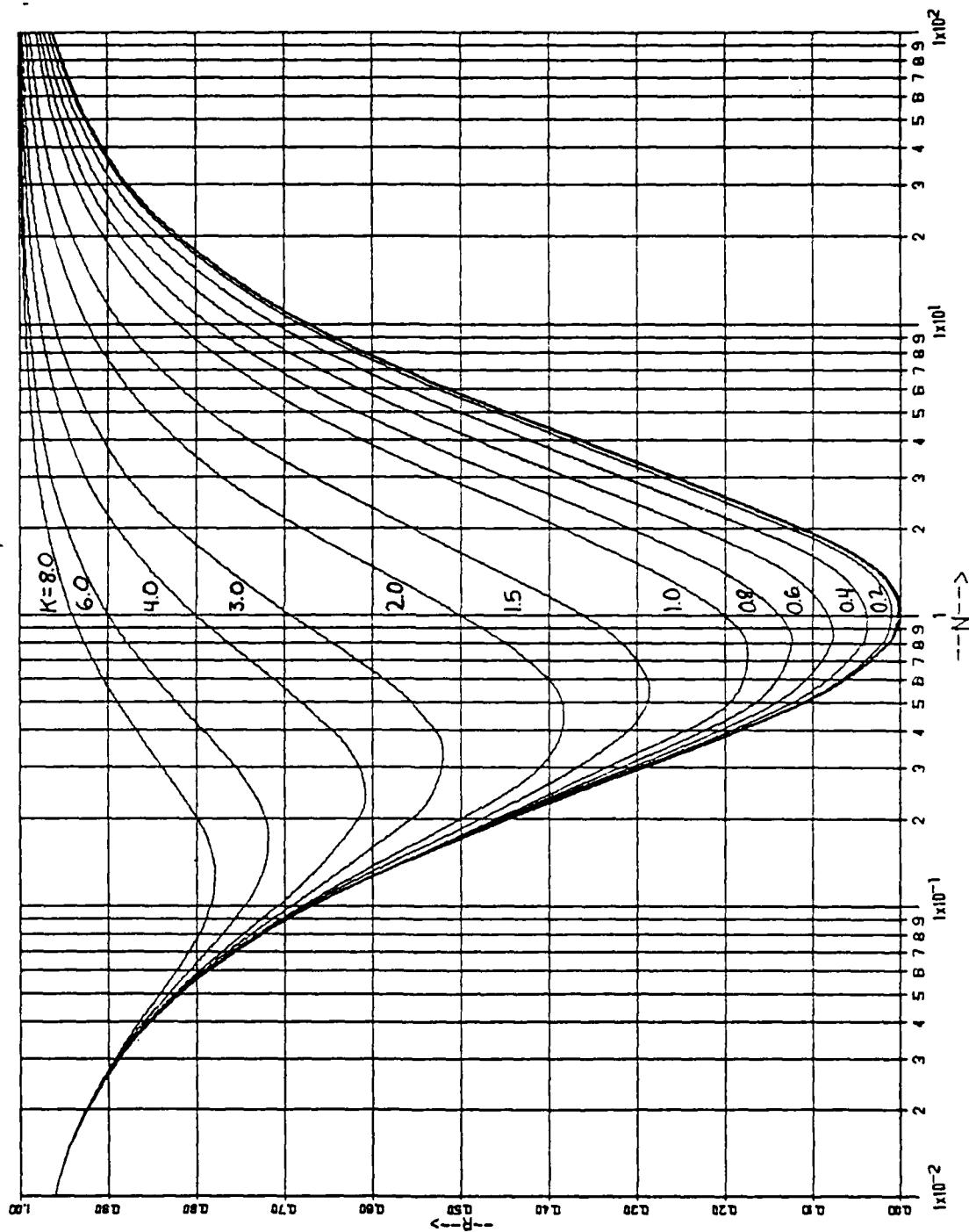


Figure 3.1.3 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 0° degrees .

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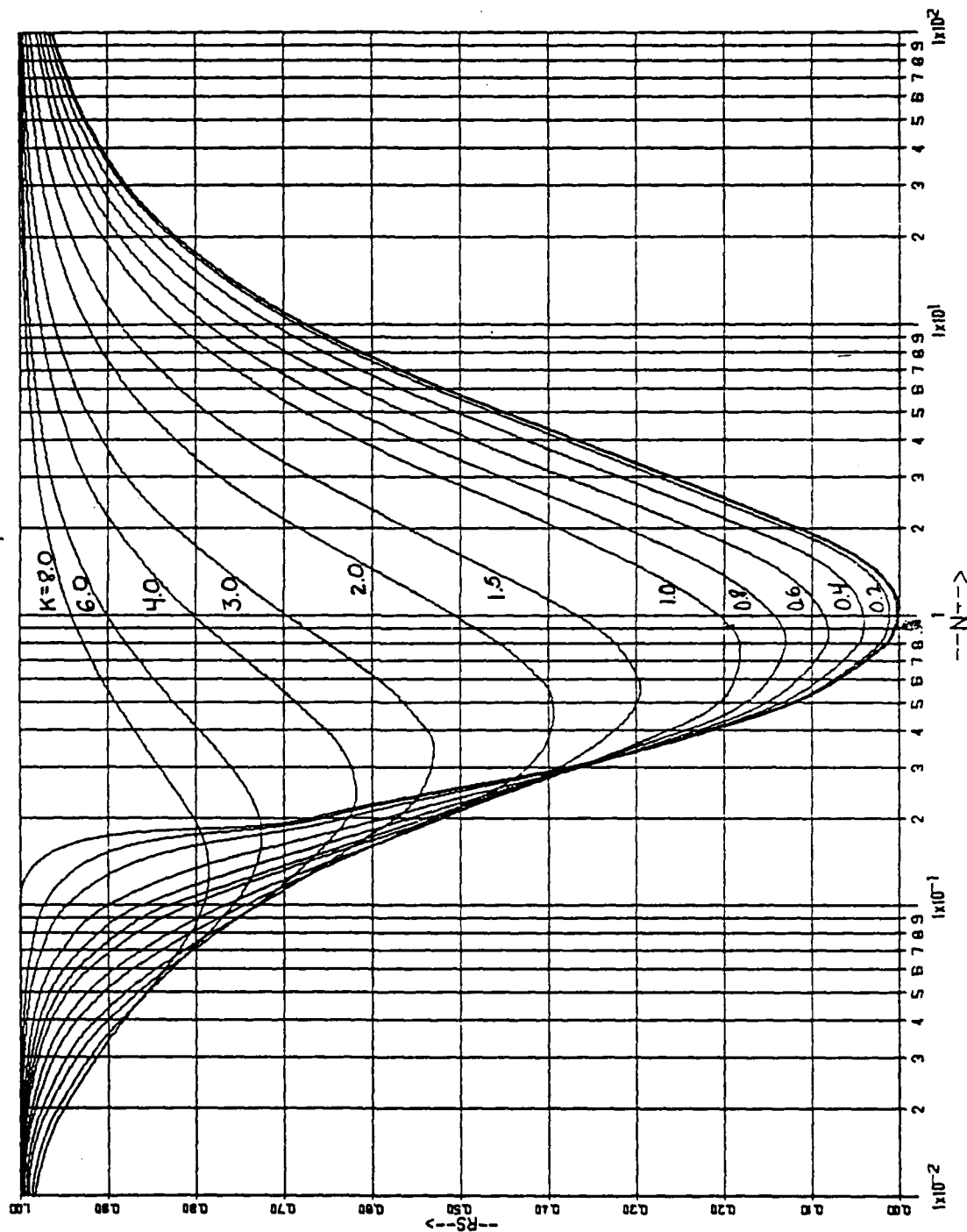


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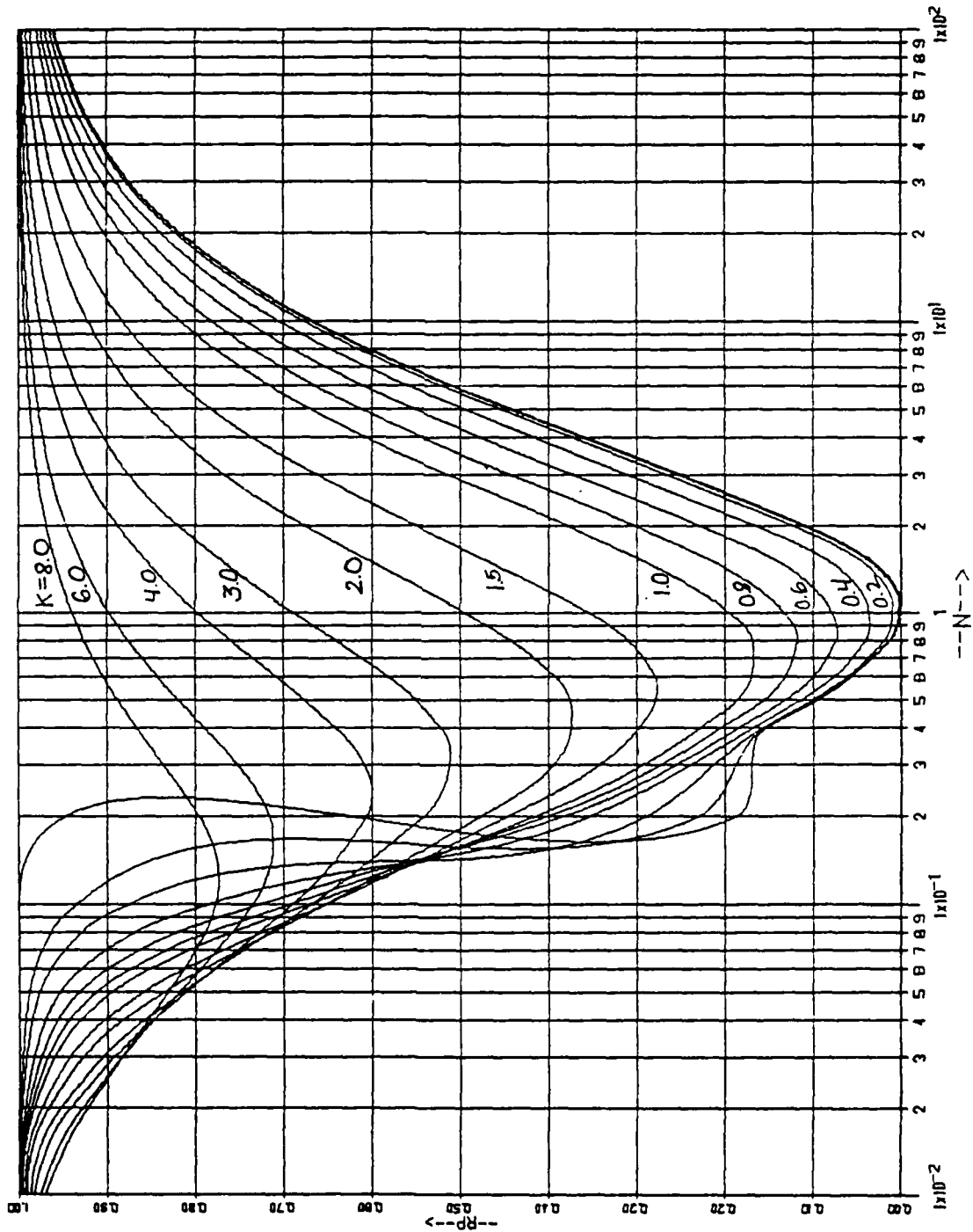


Figure 3.2.2 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 10° degrees.

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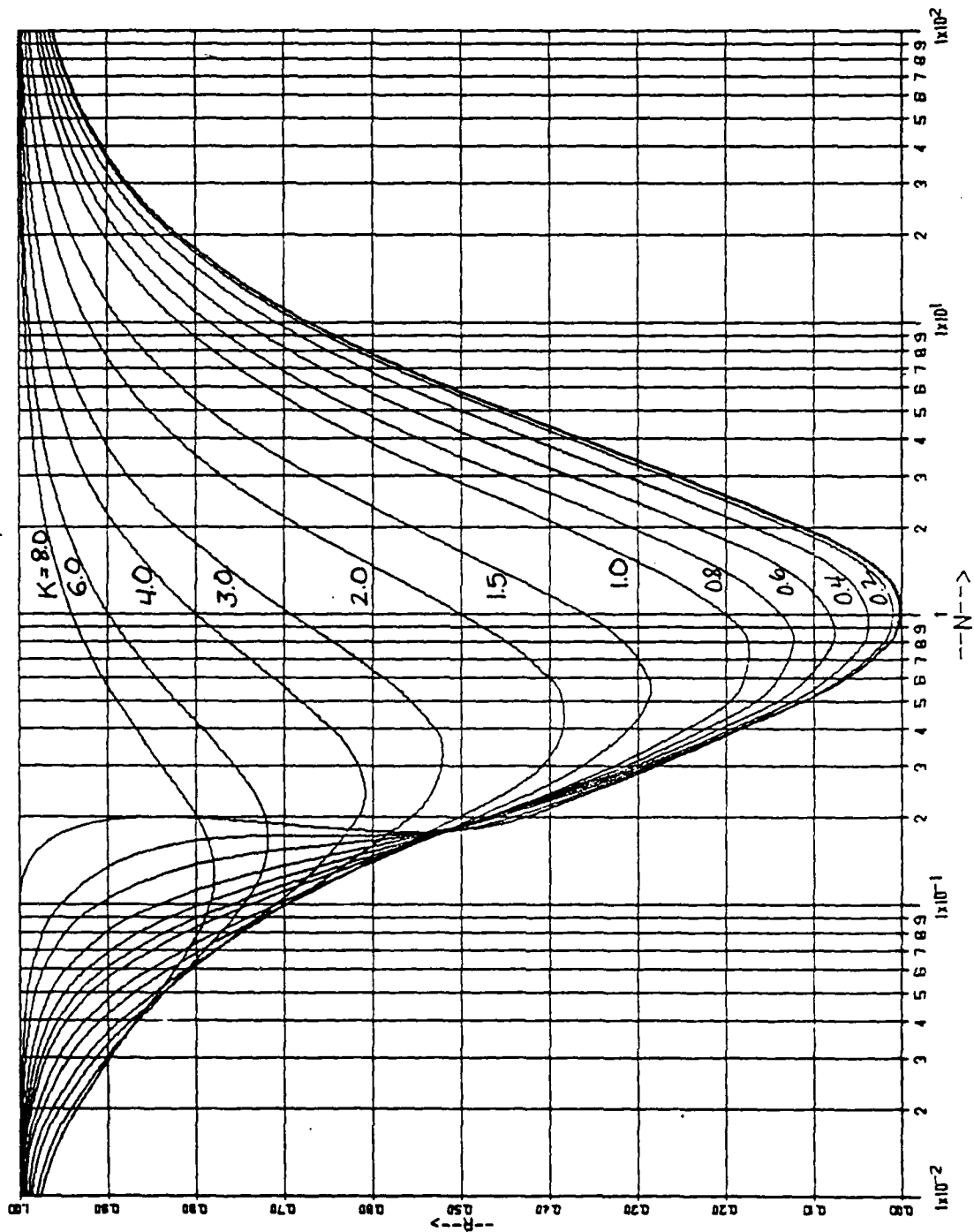


Figure 3.2.3 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 10° degrees.

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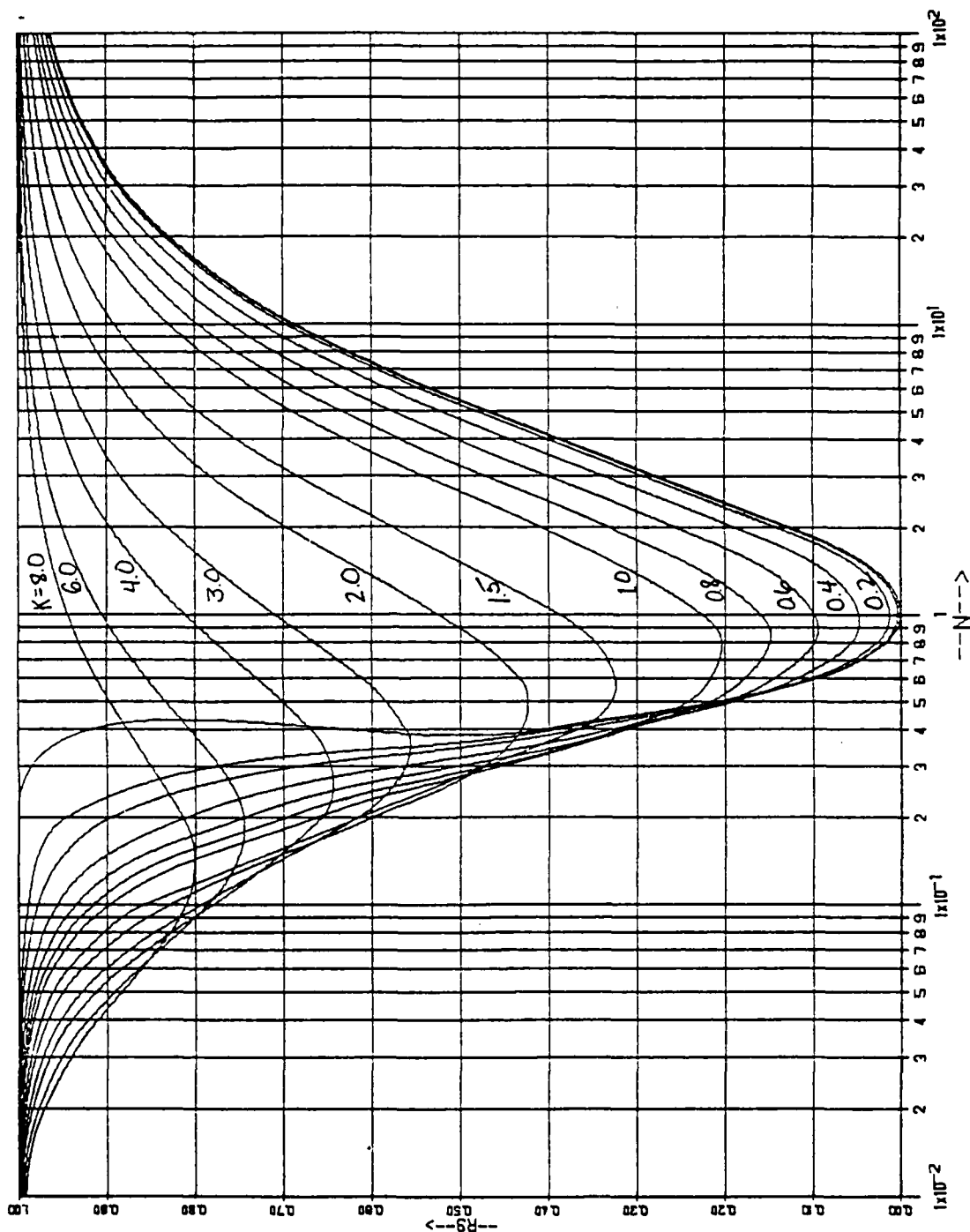


Figure 3.3.1 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 20° degrees .

PHI- 20.

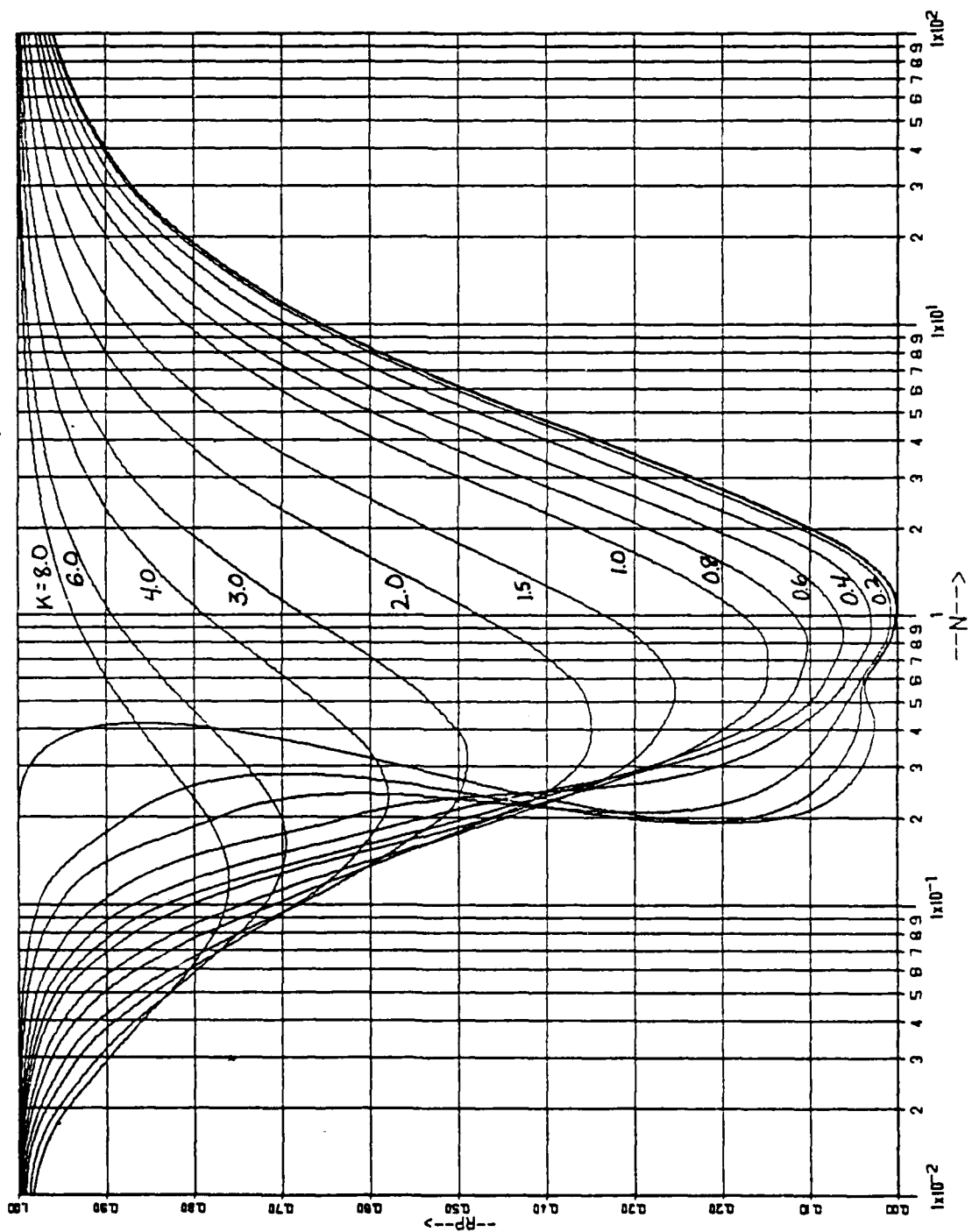


Figure 3.3.2 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 20° degrees.

PHI- 20.

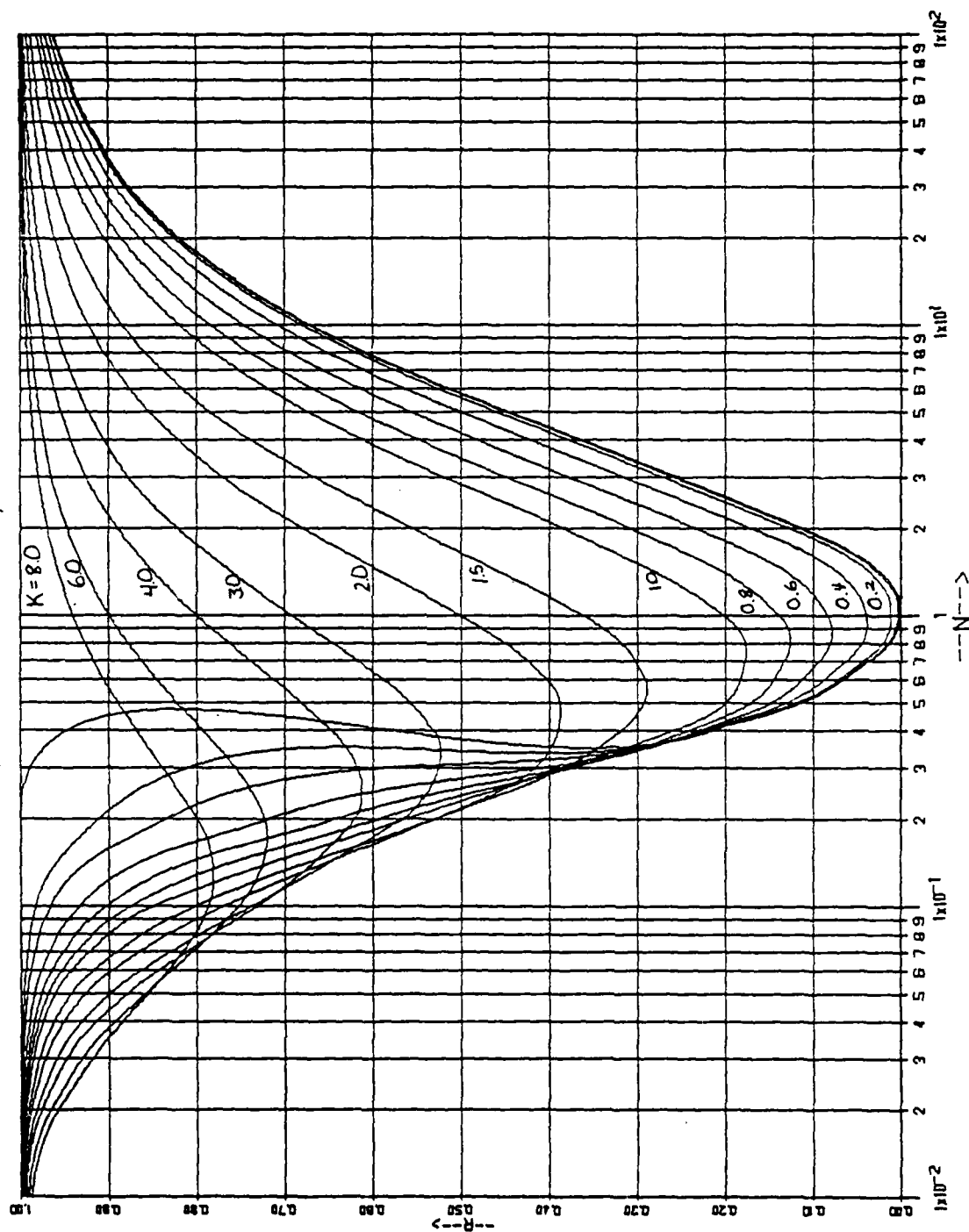


Figure 3.3.3 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 20° degrees .

PHI- 30.

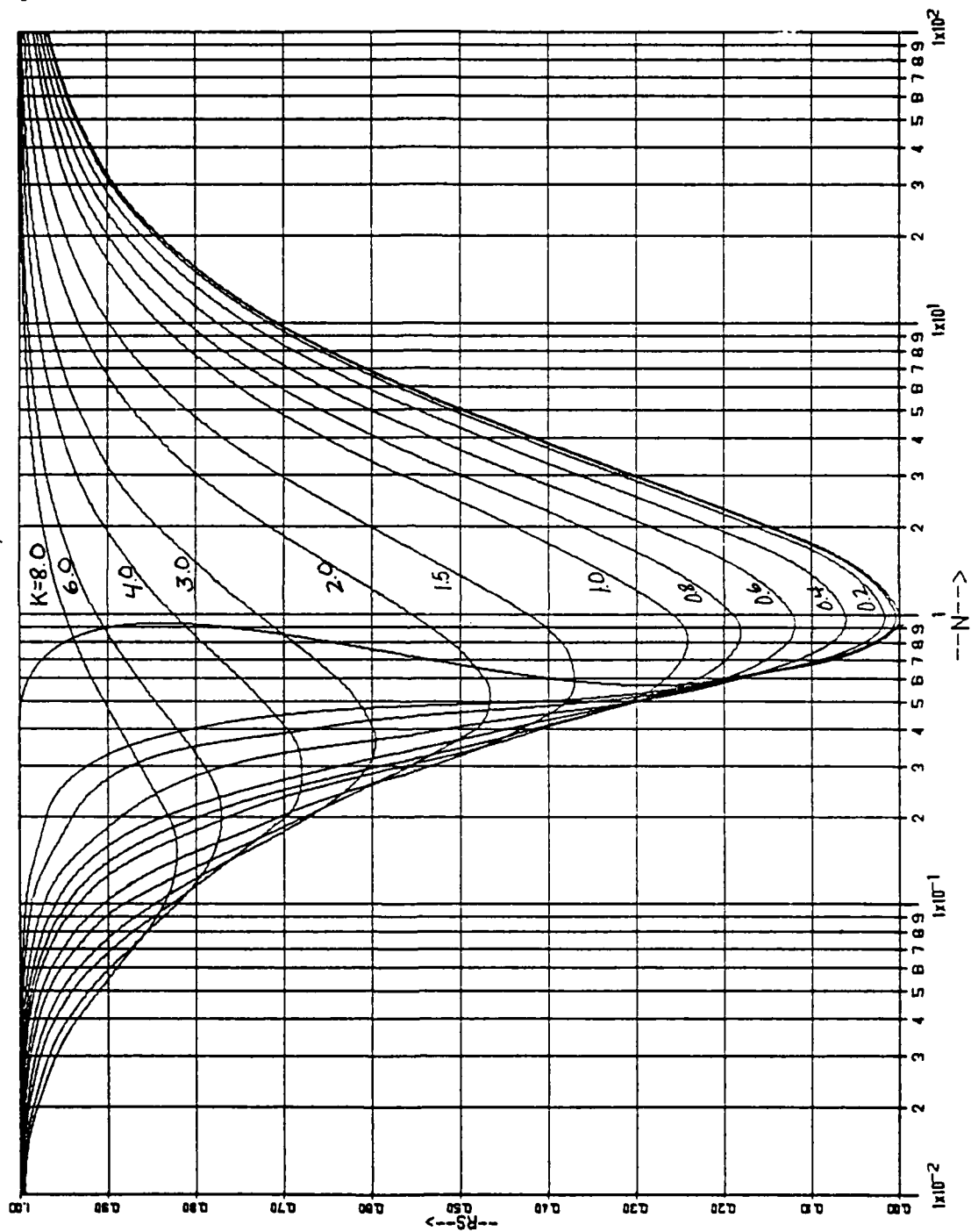


Figure 3.4.1 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 30° degrees.

PHI- 30.

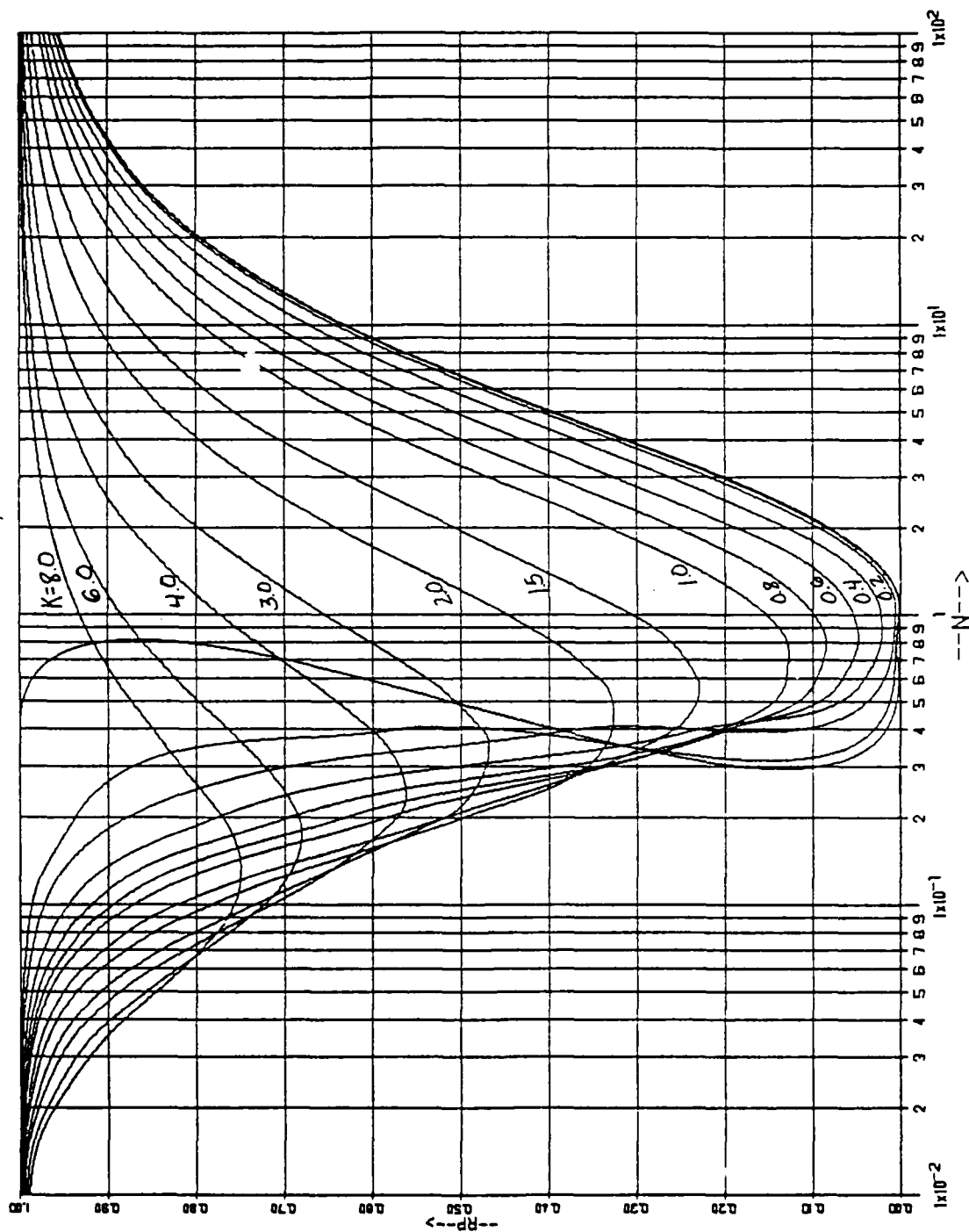


Figure 3.4.2 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 30° degrees .

PHI- 30.

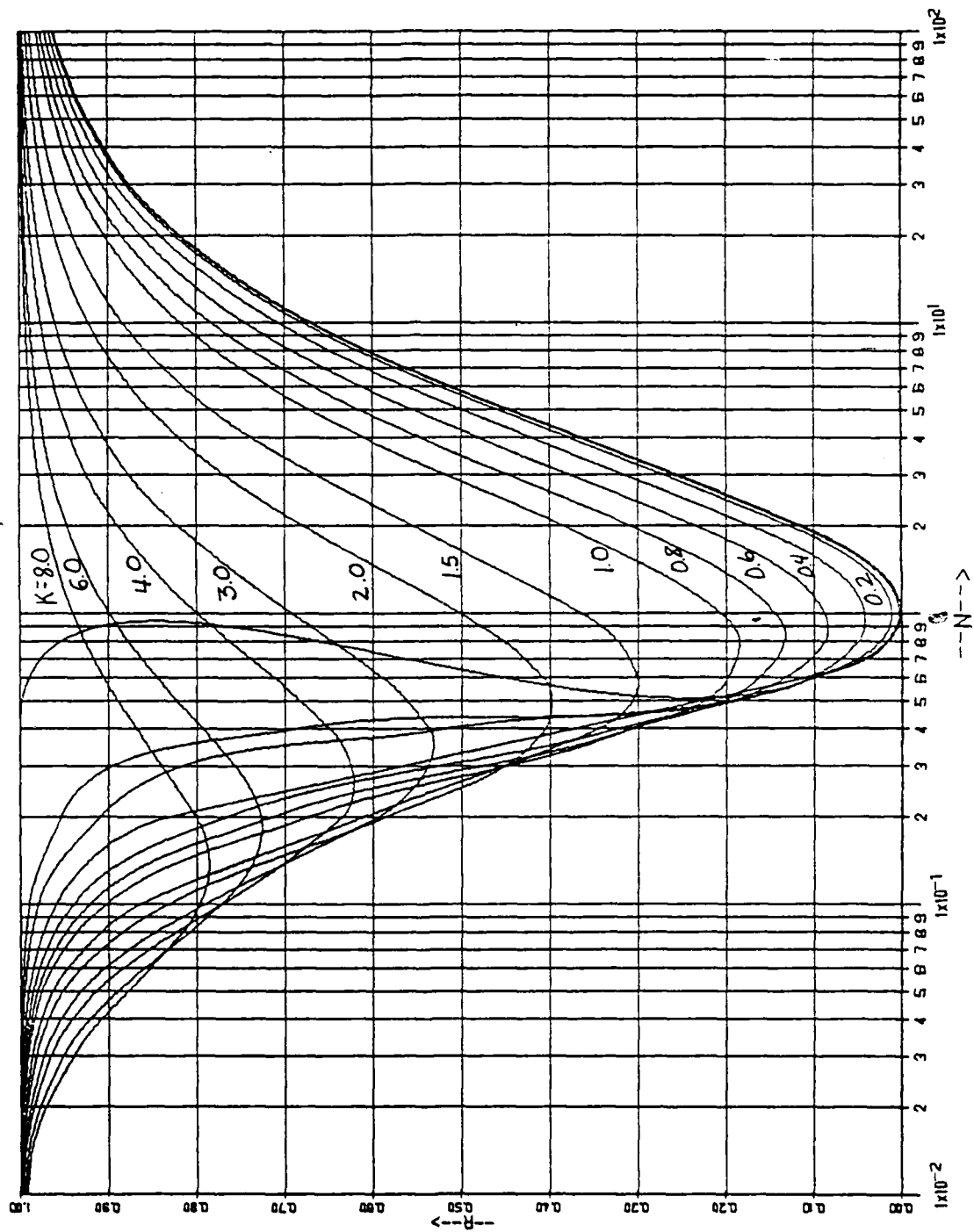


Figure 3.4.3 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 30° degrees.

PHI- 40.

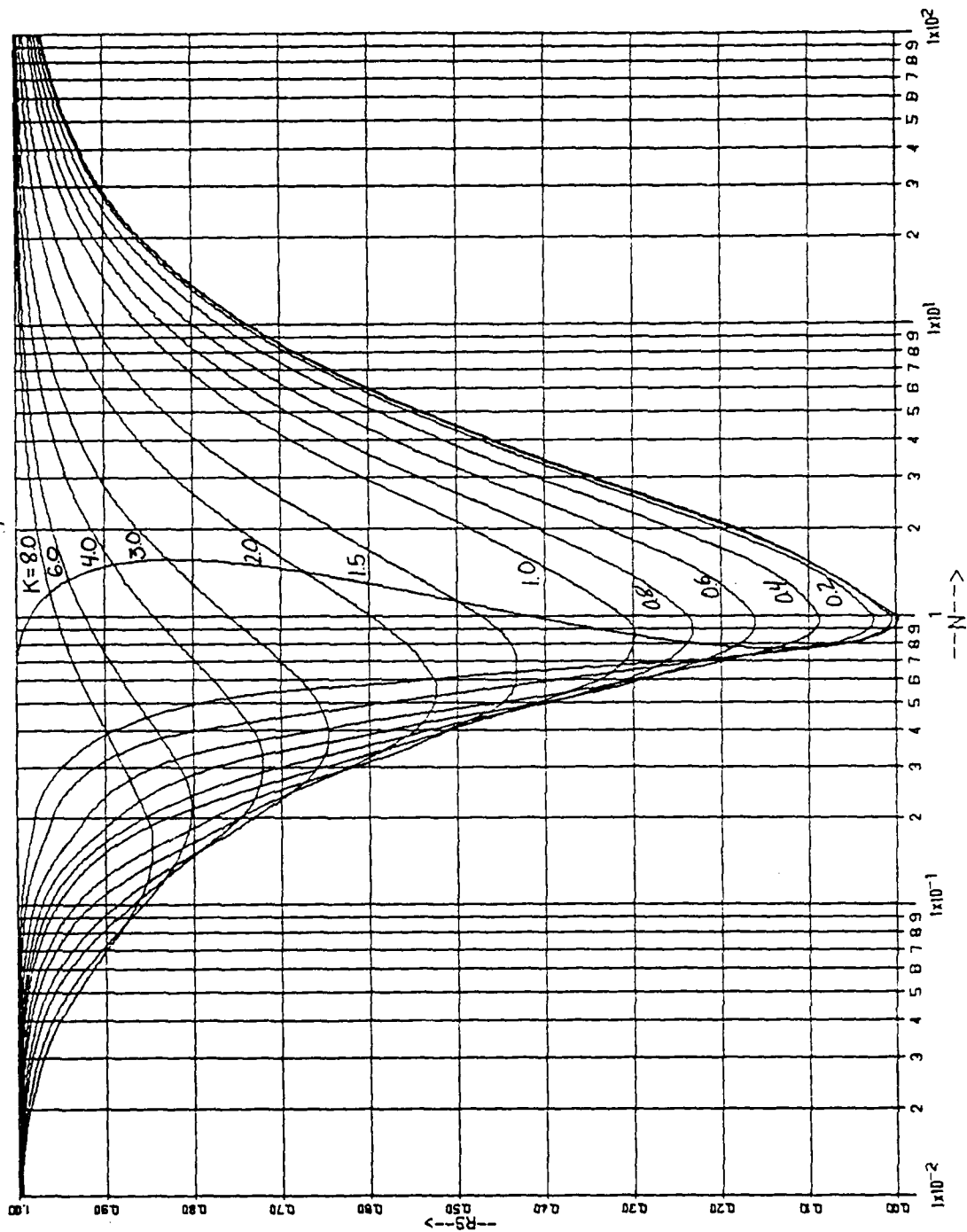


Figure 3.5.1 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 40° degrees.

PHI- 40.

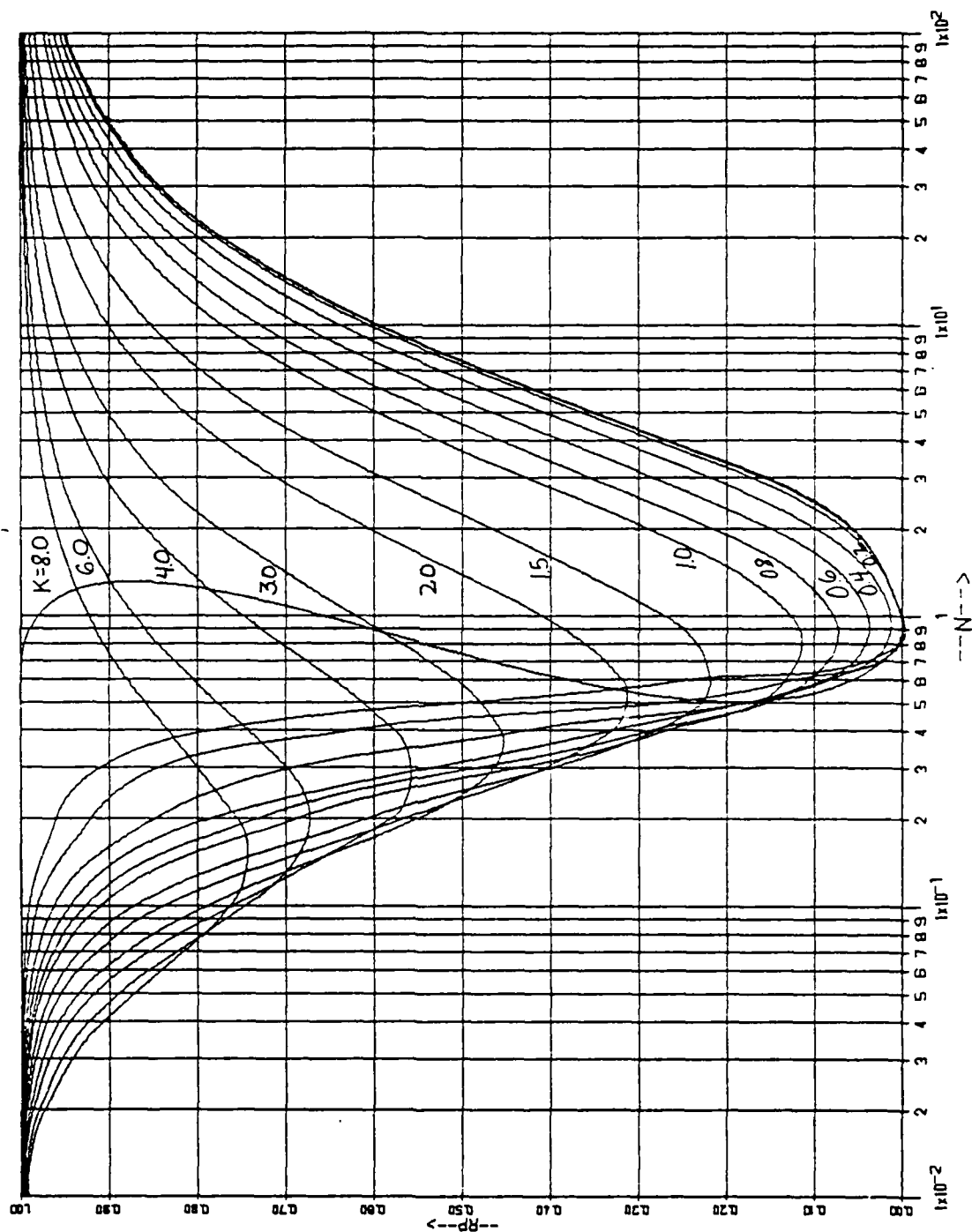


Figure 3.5.2 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 40° degrees.

PHI- 40.

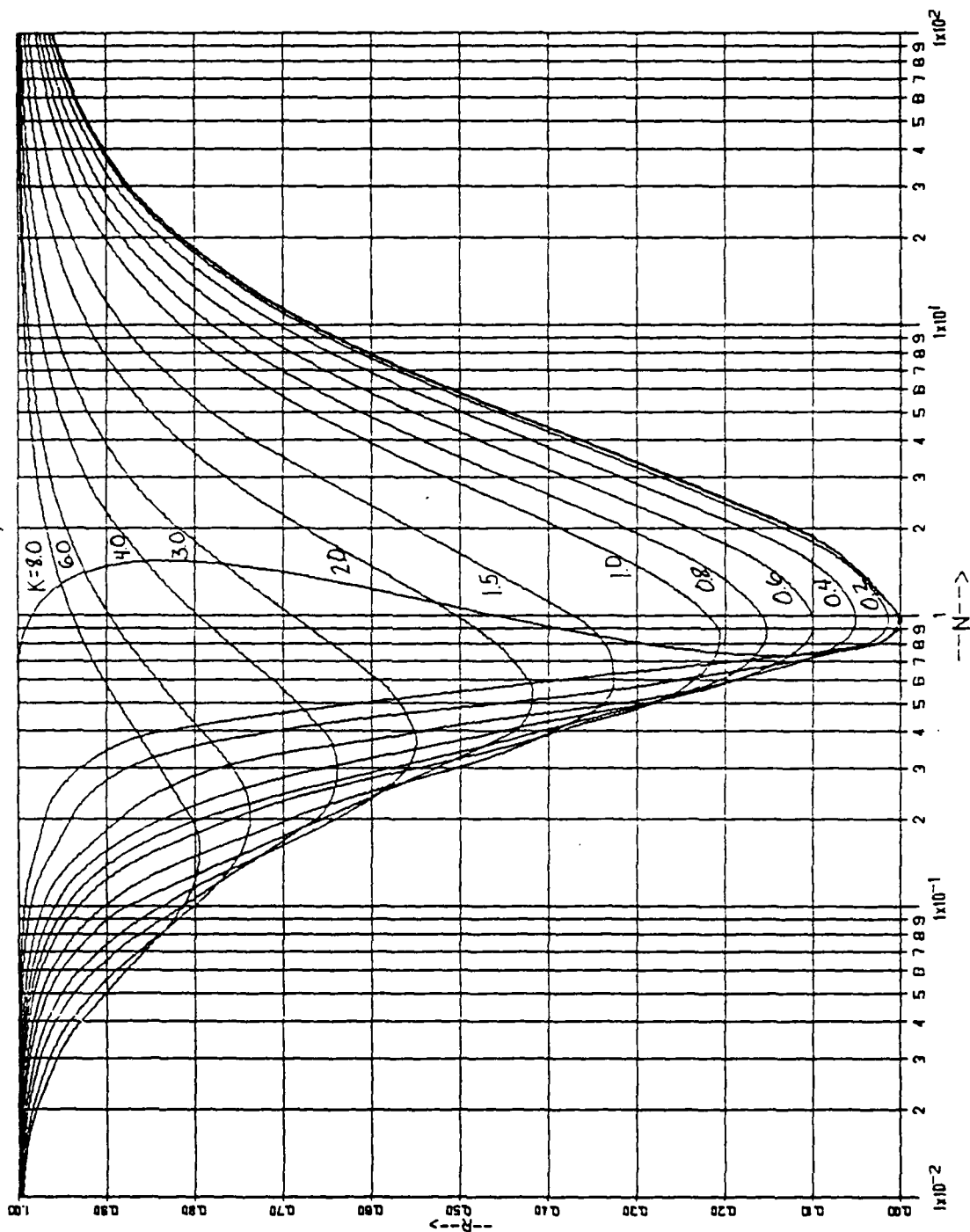


Figure 3.5.3 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 40° degrees .

PHI- 50.

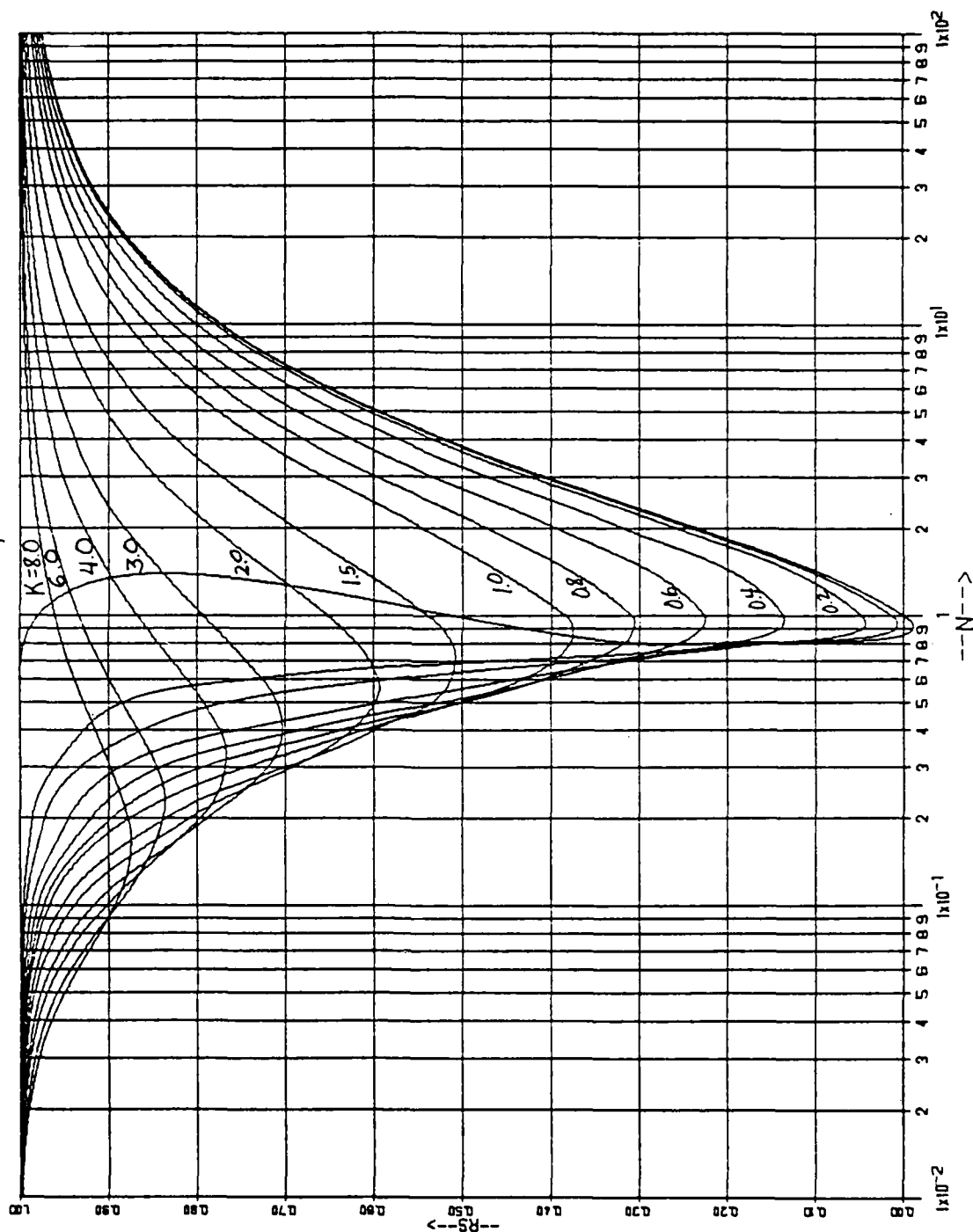


Figure 3.6.1 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 50° degrees.

PHI- 50.

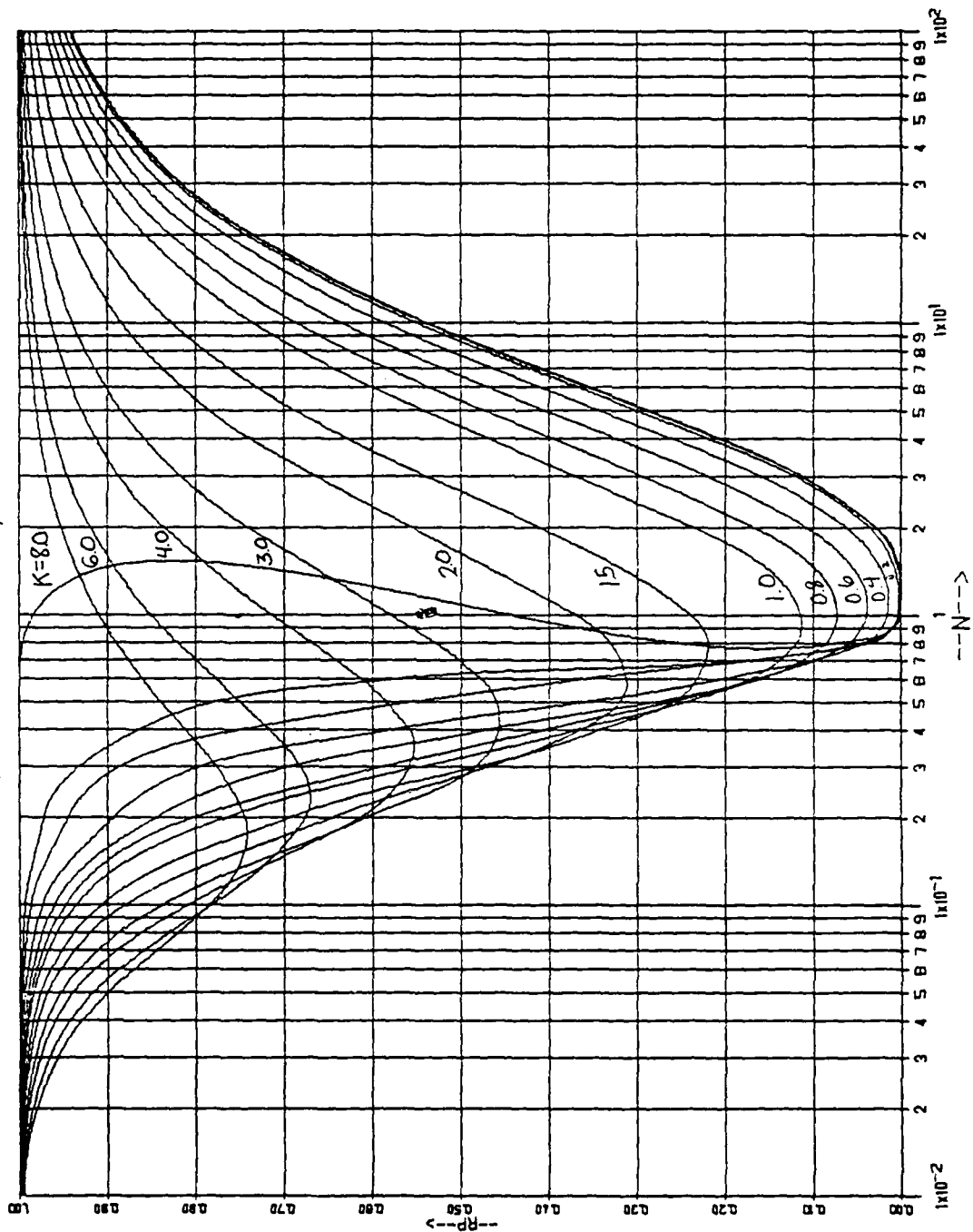


Figure 3.6.2 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 50° degrees .

PHI - 50.

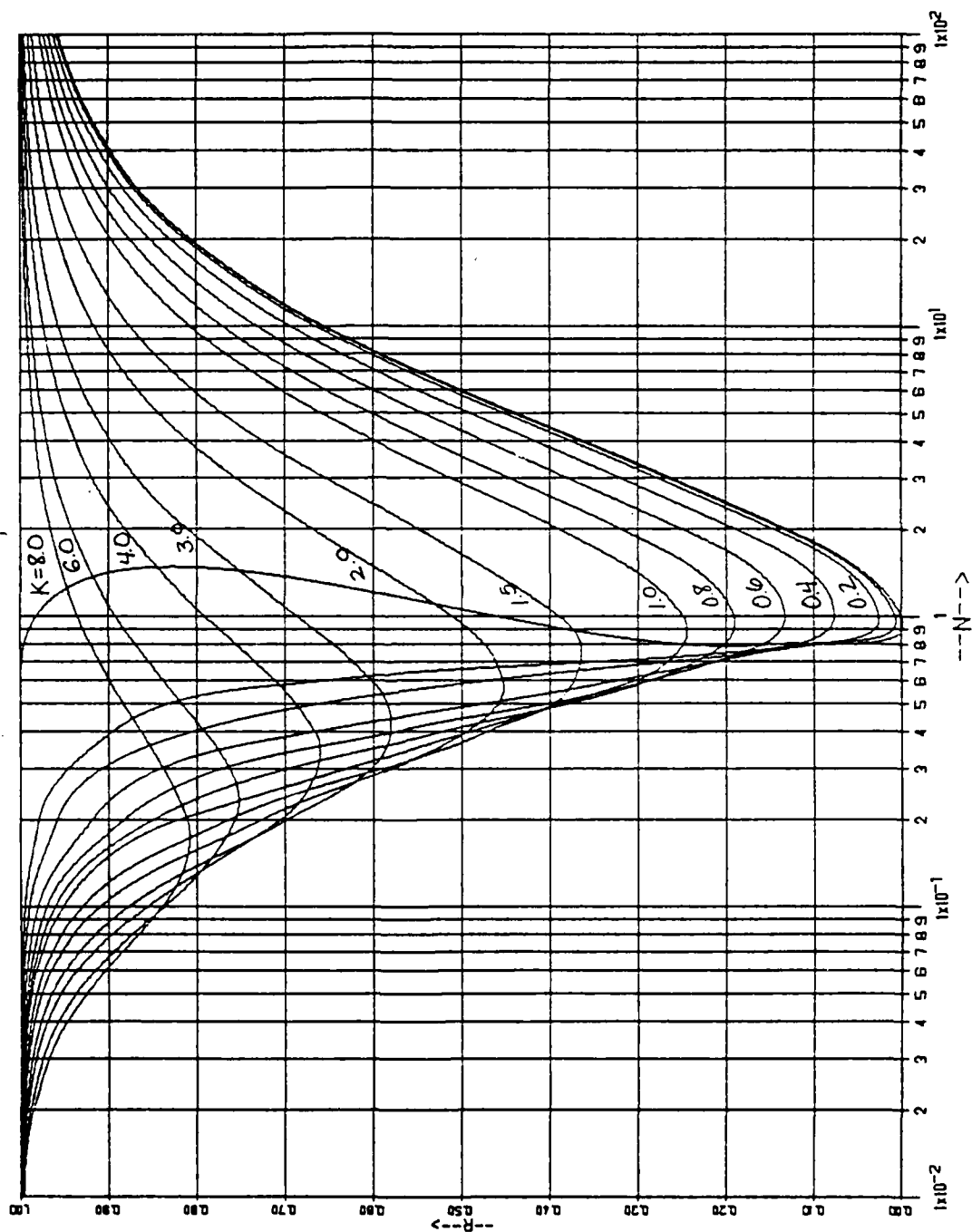


Figure 3.6.3 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 50 degrees.

PHI- 60.

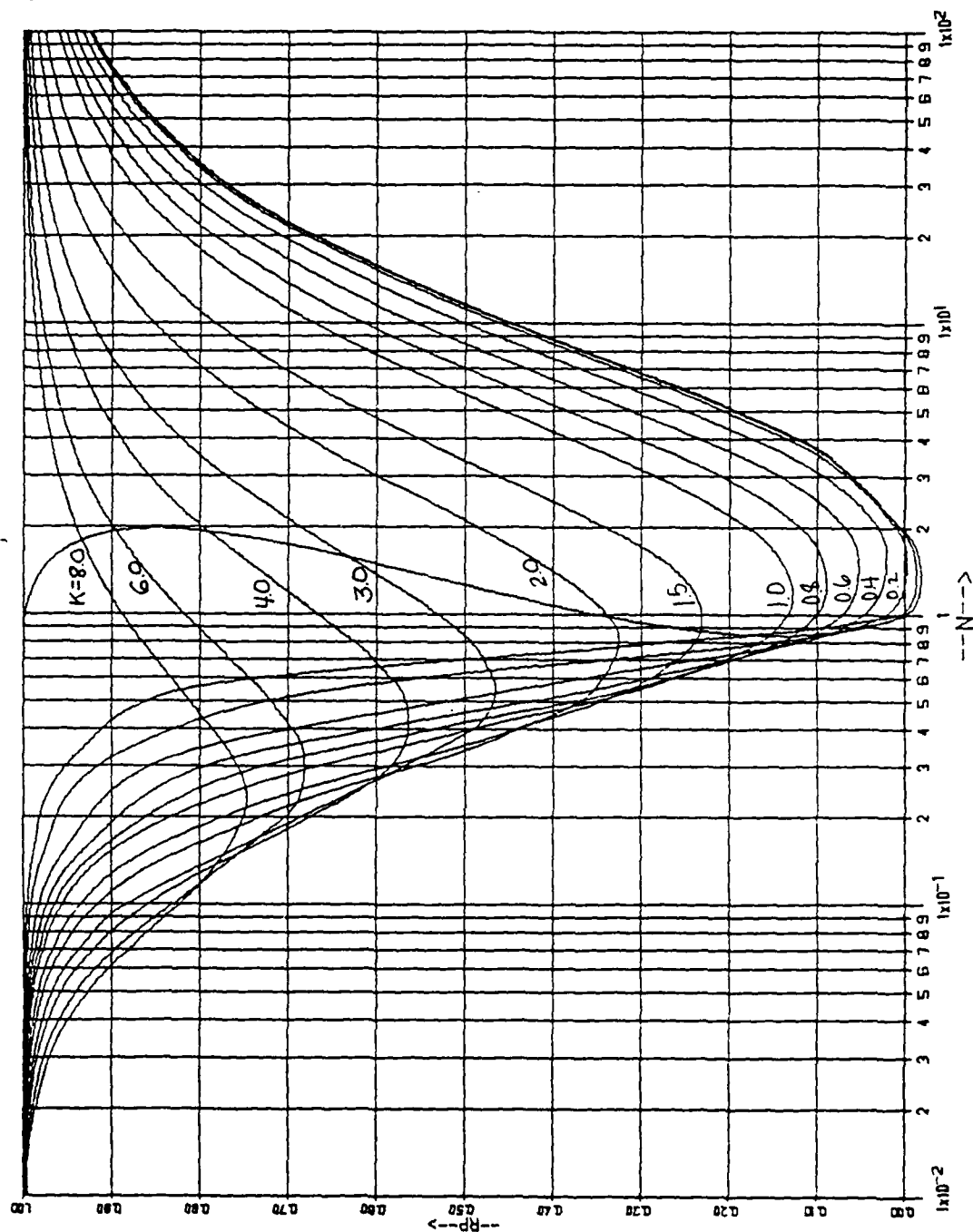


Figure 3.7.1 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 60° degrees.

PHI - 60.

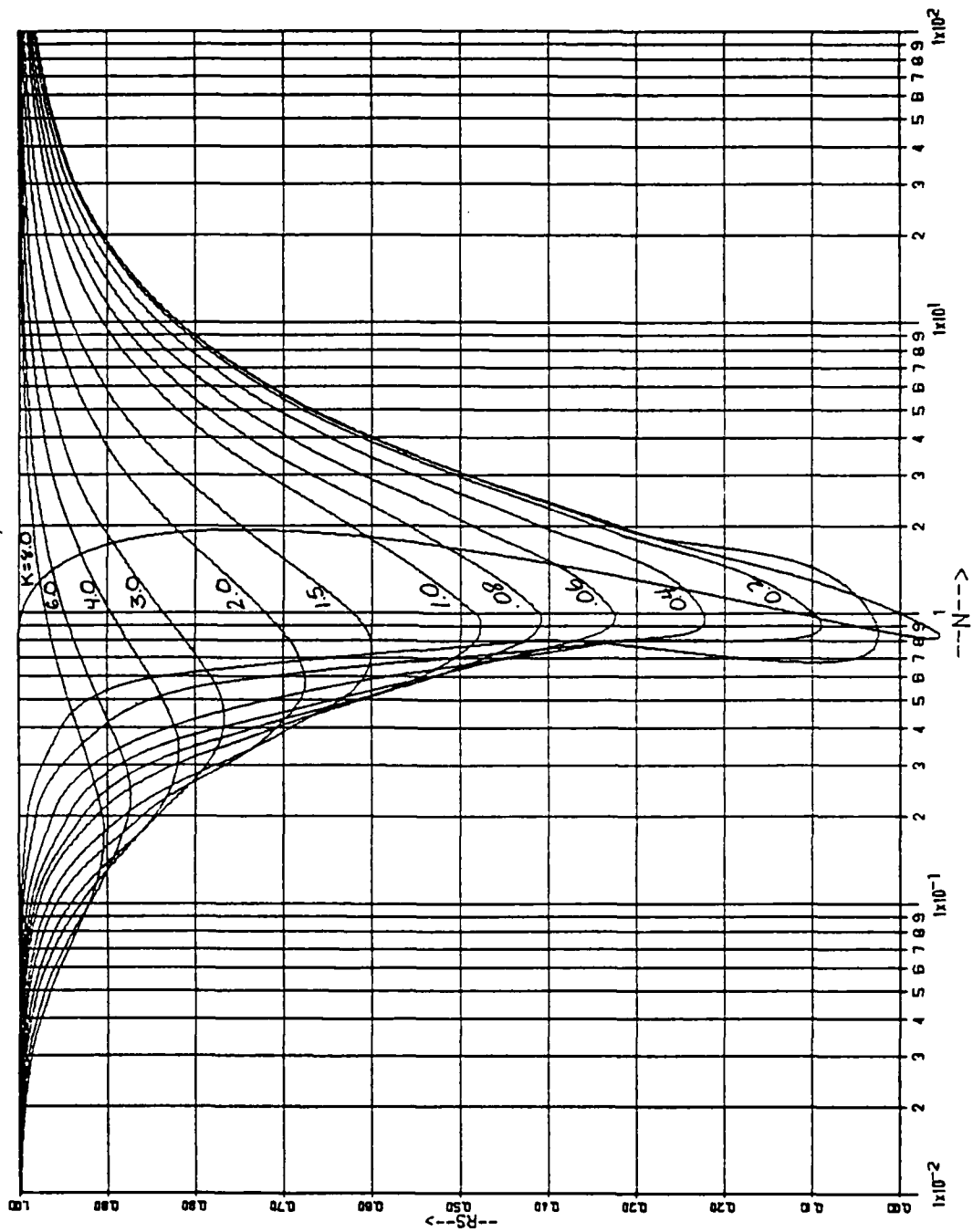


Figure 3.7.2 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 60° degrees.

PHI- 60.

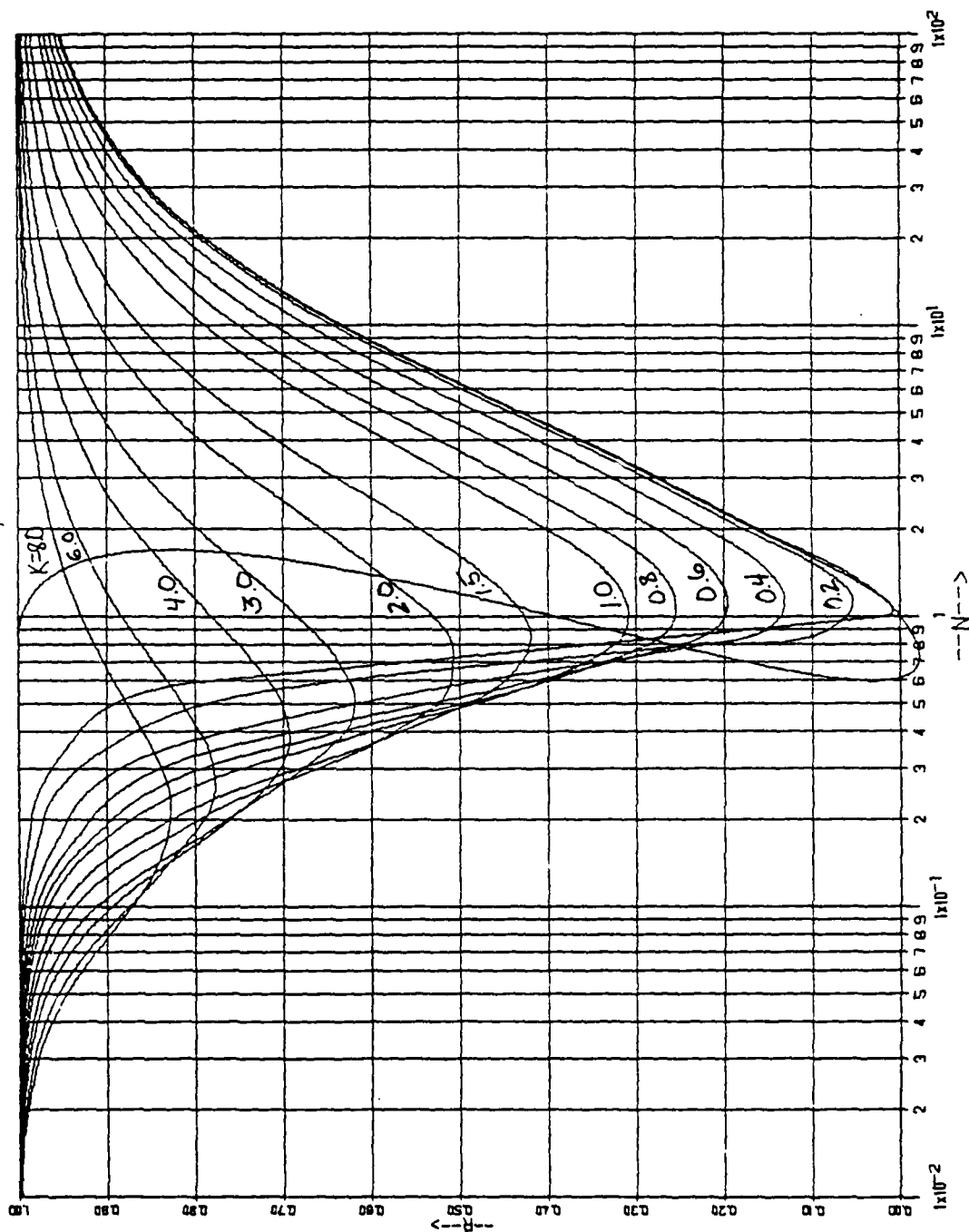


Figure 3.7.3 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 60° degrees .

PHI- 70.

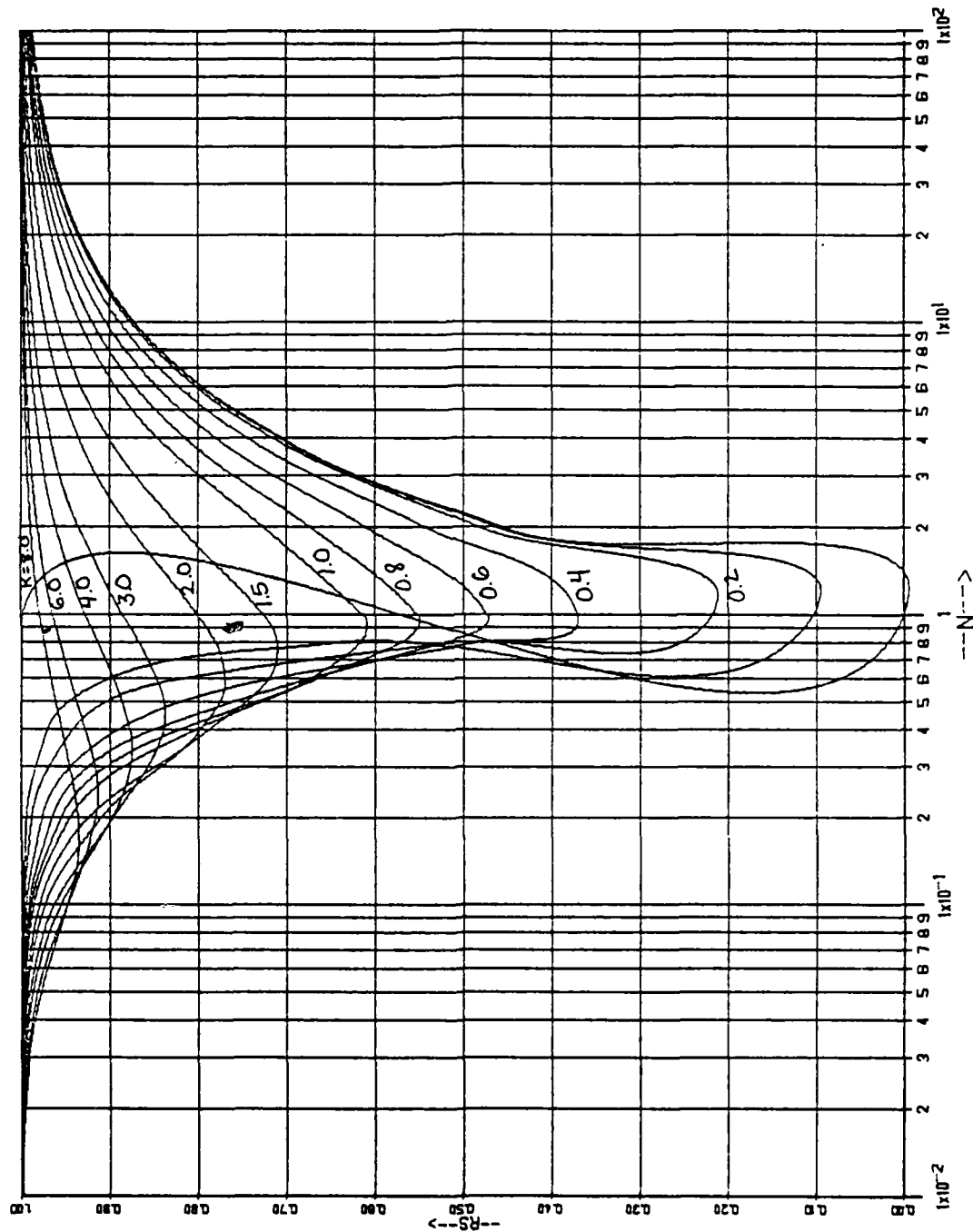


Figure 3.8.1 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 70° degrees.

PHI - 70.

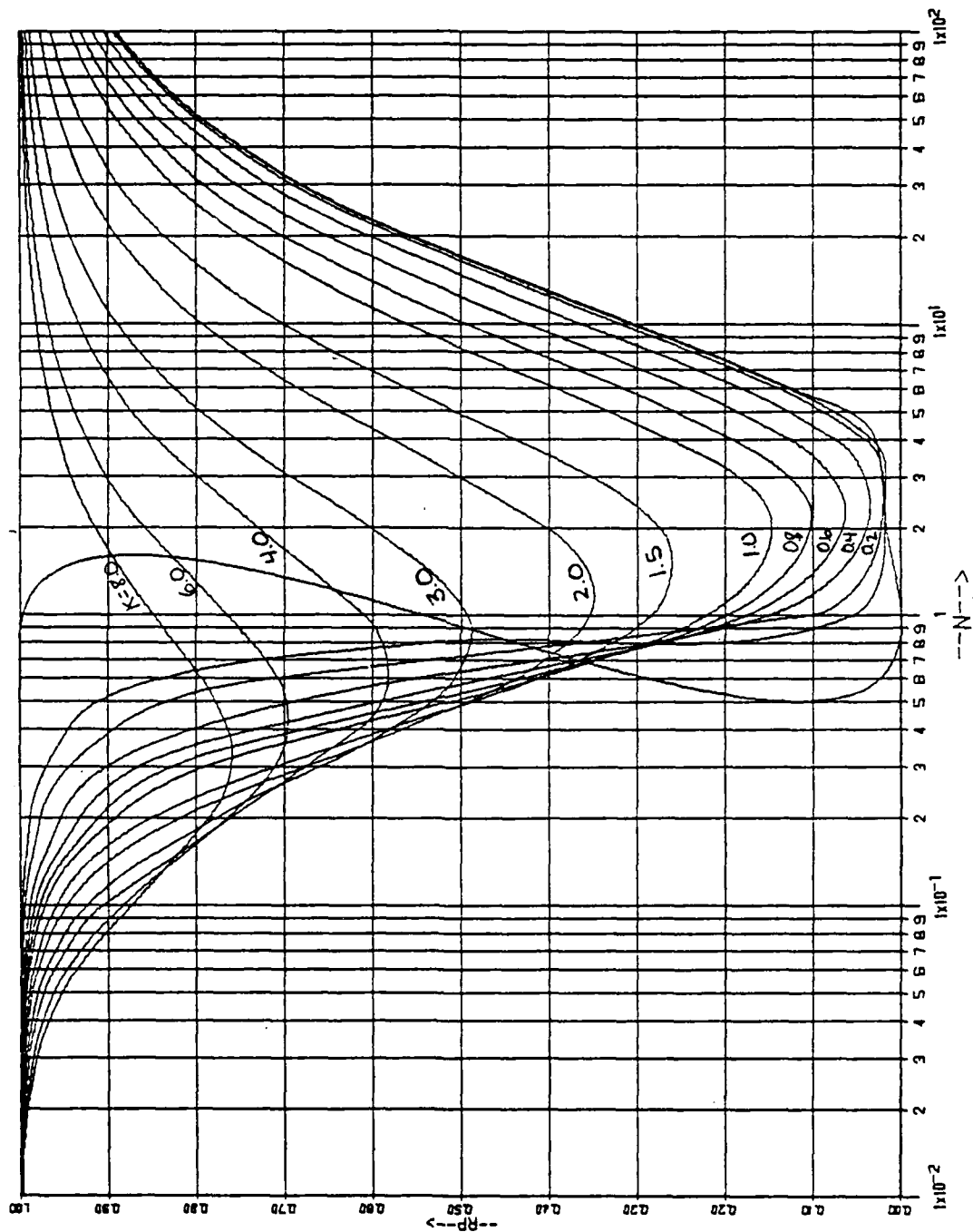


Figure 3.8.2 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 70° degrees.

PHI- 70.

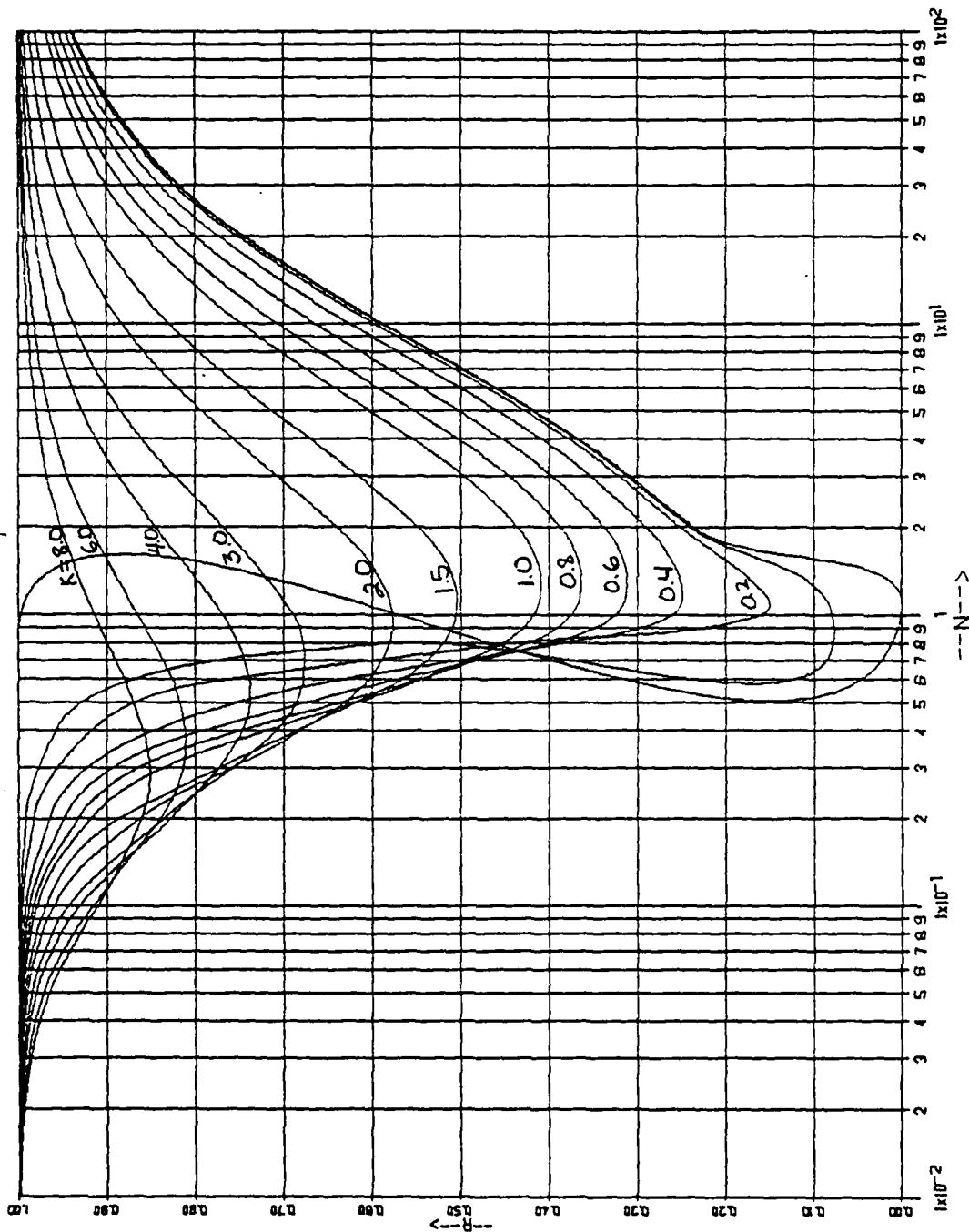


Figure 3.8.3 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 70 degrees.

PHI - 80.

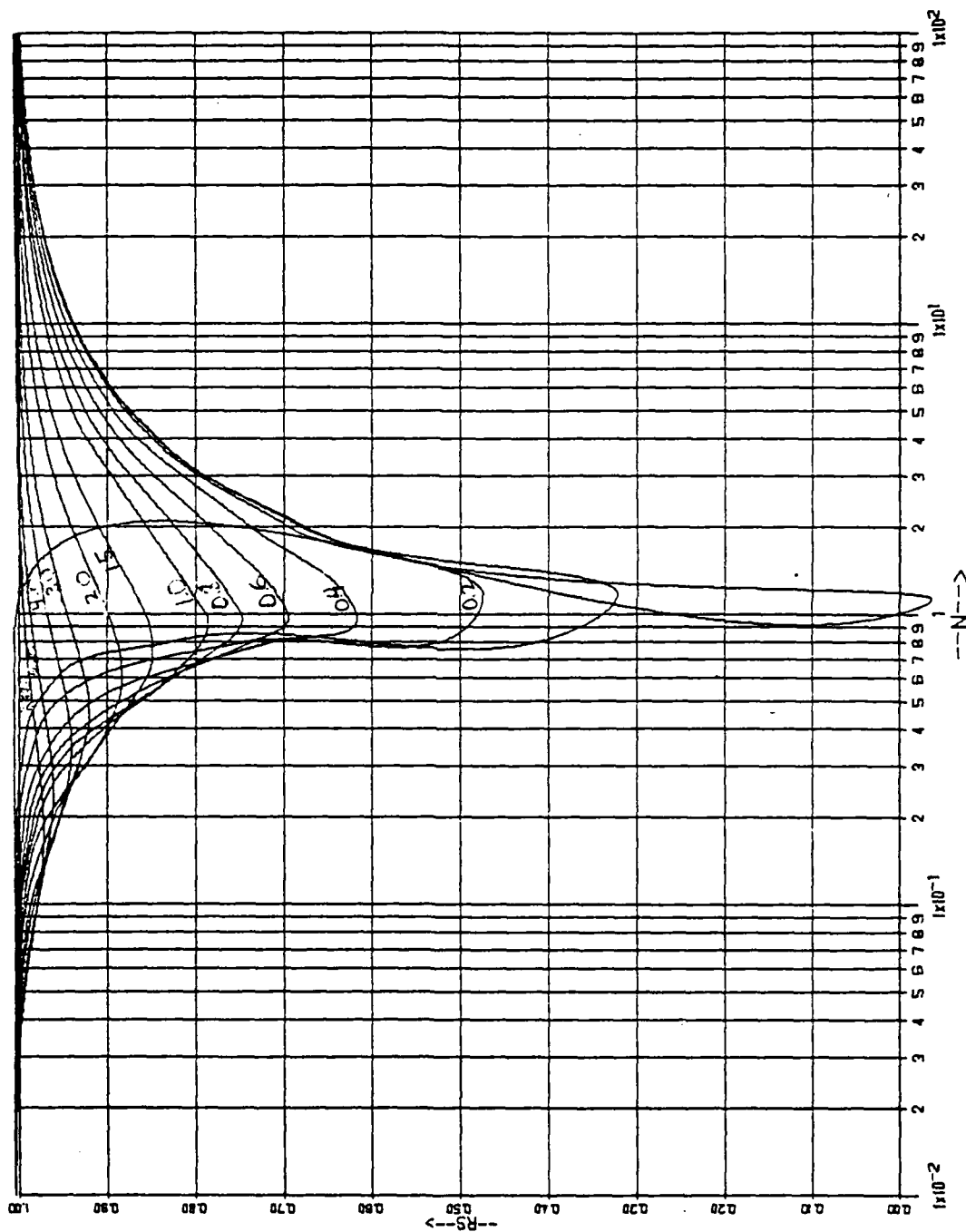


Figure 3.9.1 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 80° degrees .

PHI- 80.

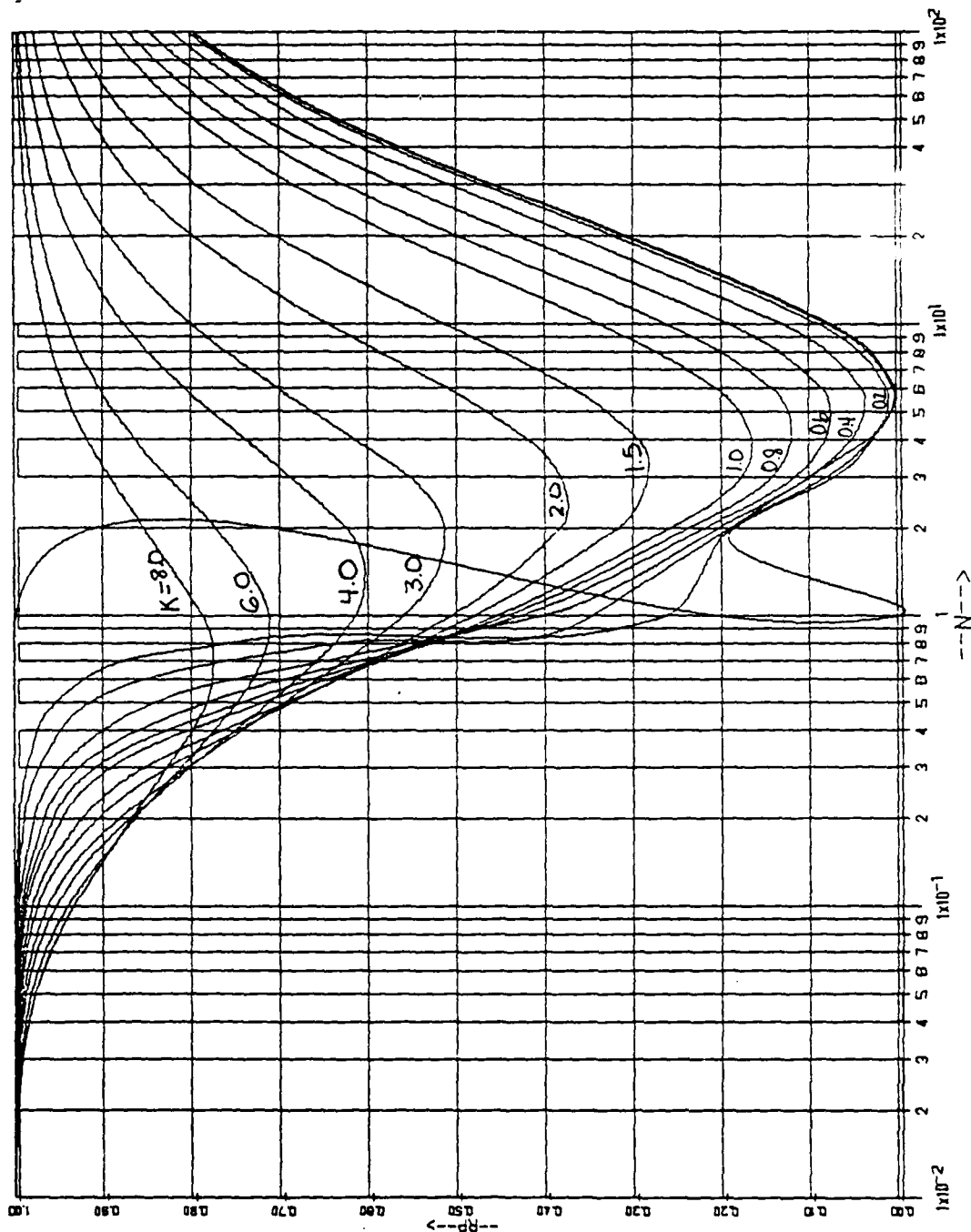


Figure 3.9.2 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 80° degrees.

PHI- 80.

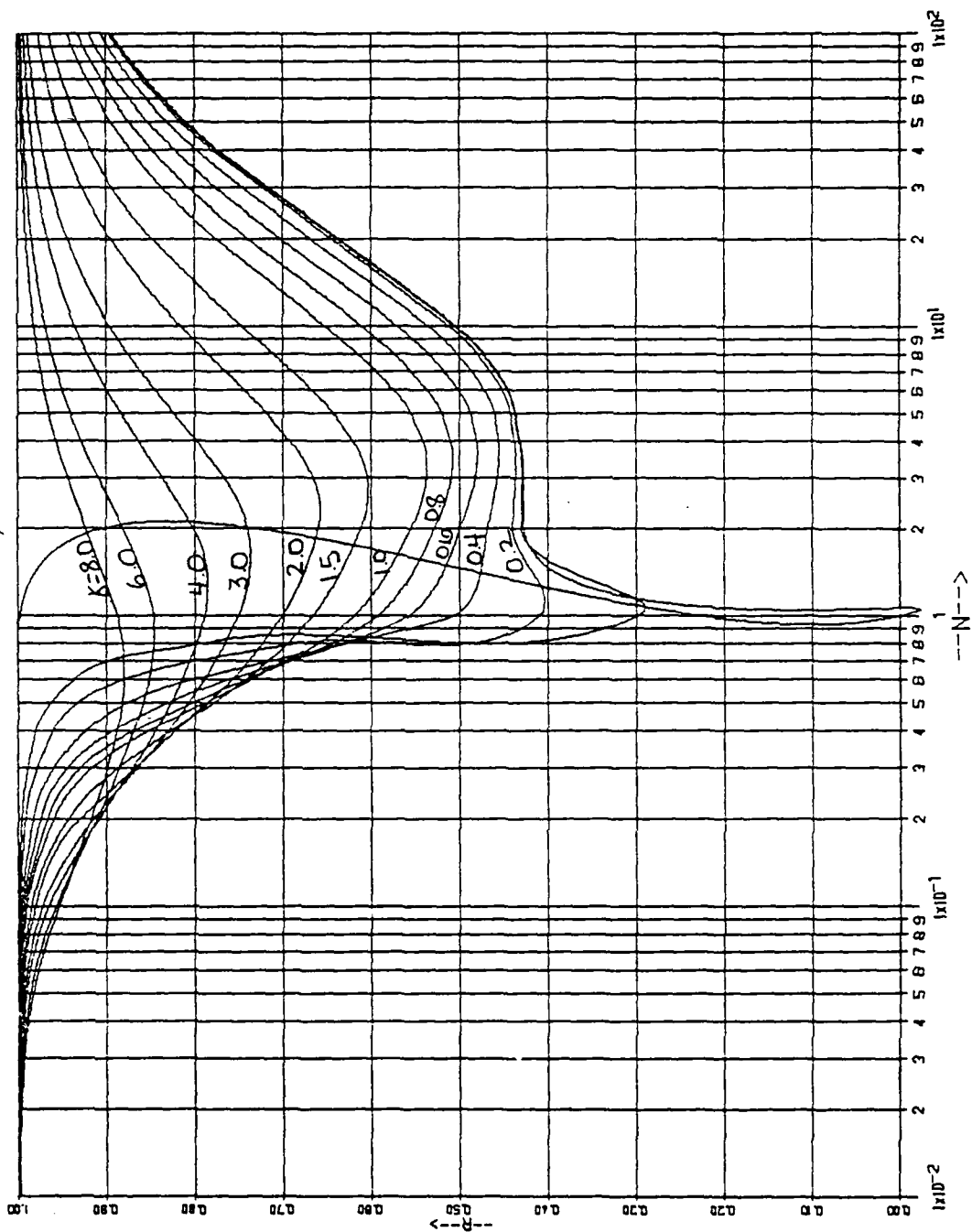


Figure 3.9.3 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 80° degrees.

PHI- 90.

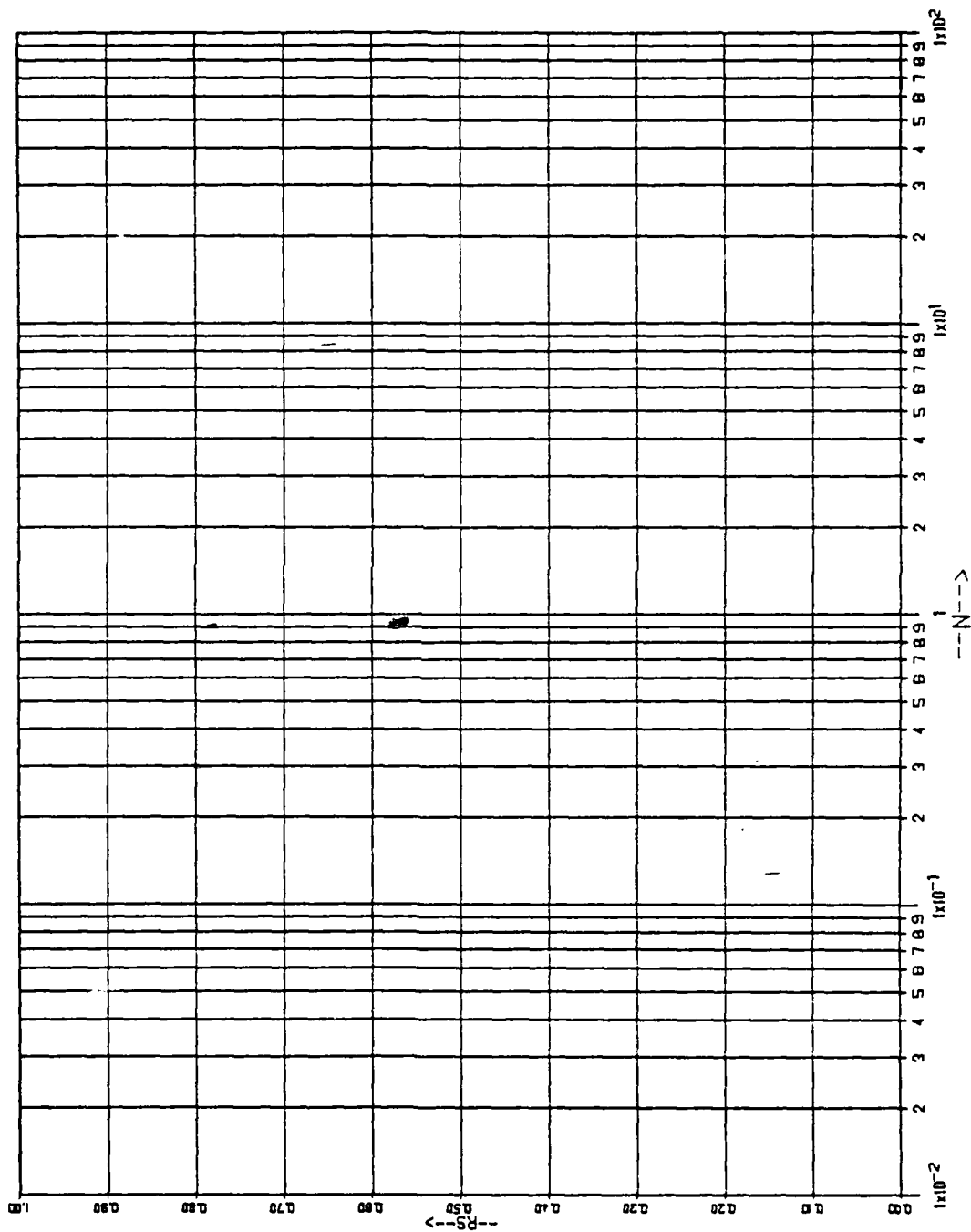


Figure 3.10.1 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 80° degrees.

PHI- 90.

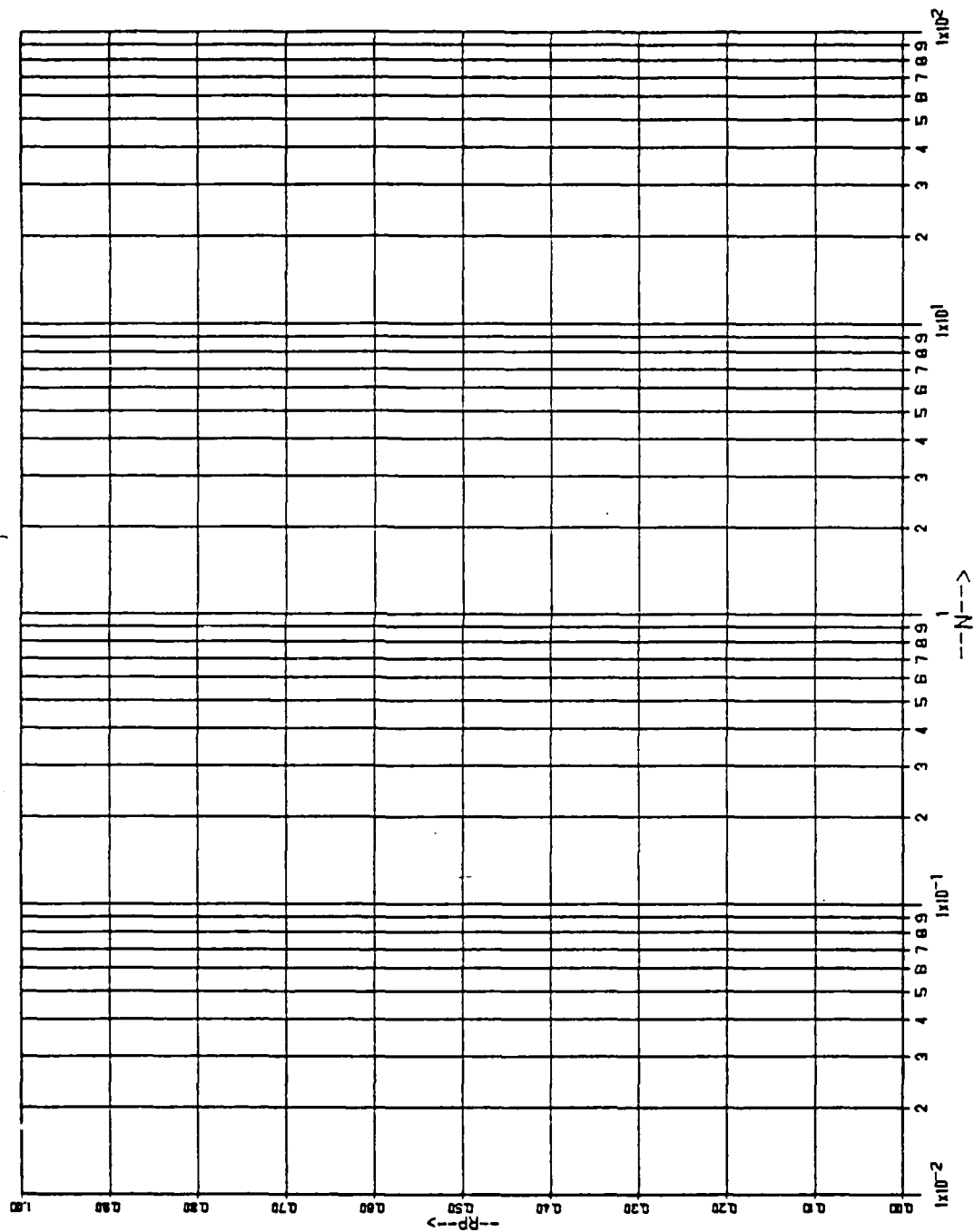


Figure 3.10.2 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 90° degrees .

PHI - 90.

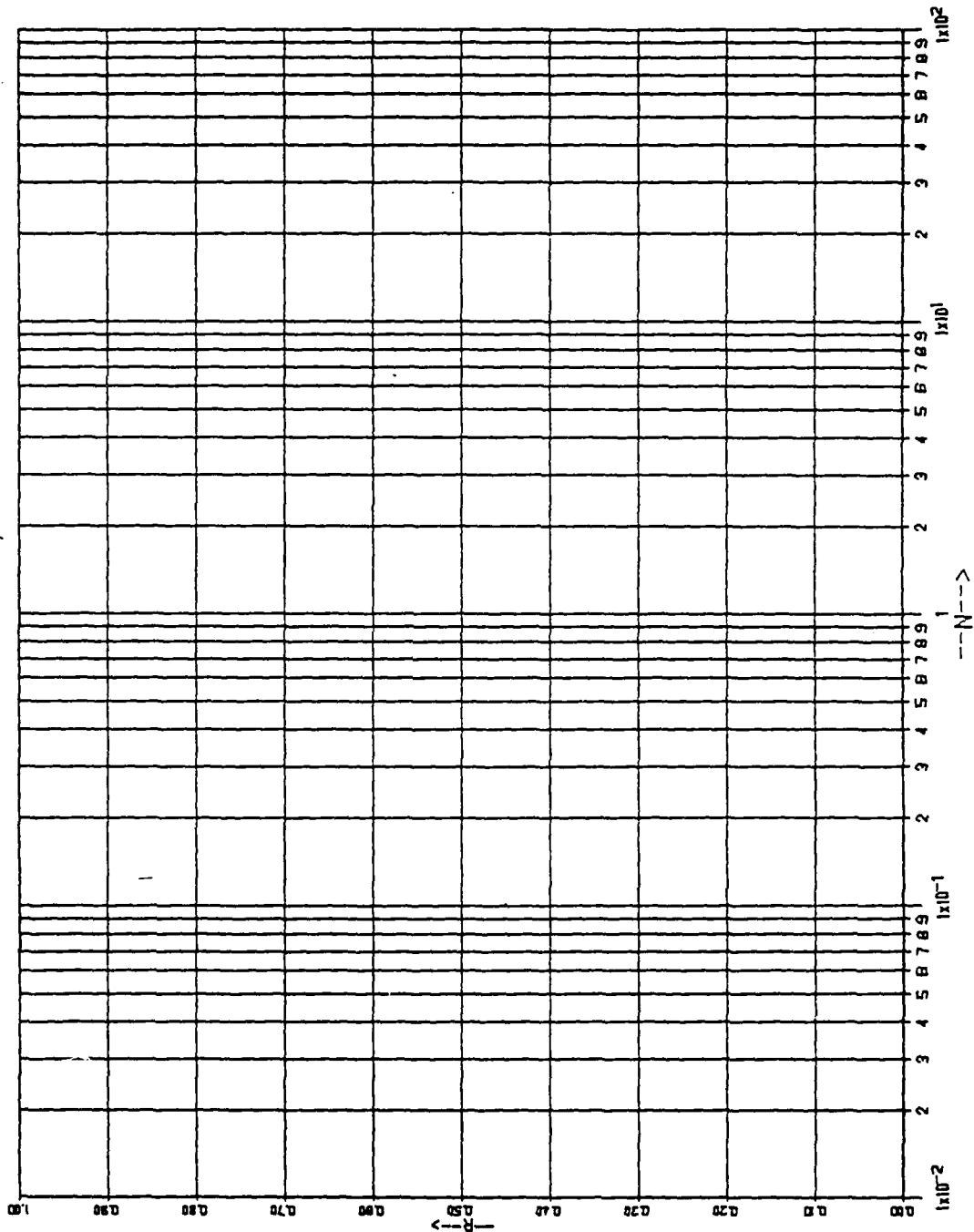


Figure 3.10.3 Simon plots of index of refraction against reflectivities for series of absorption coefficients. The angle of incidence is 90° degrees.

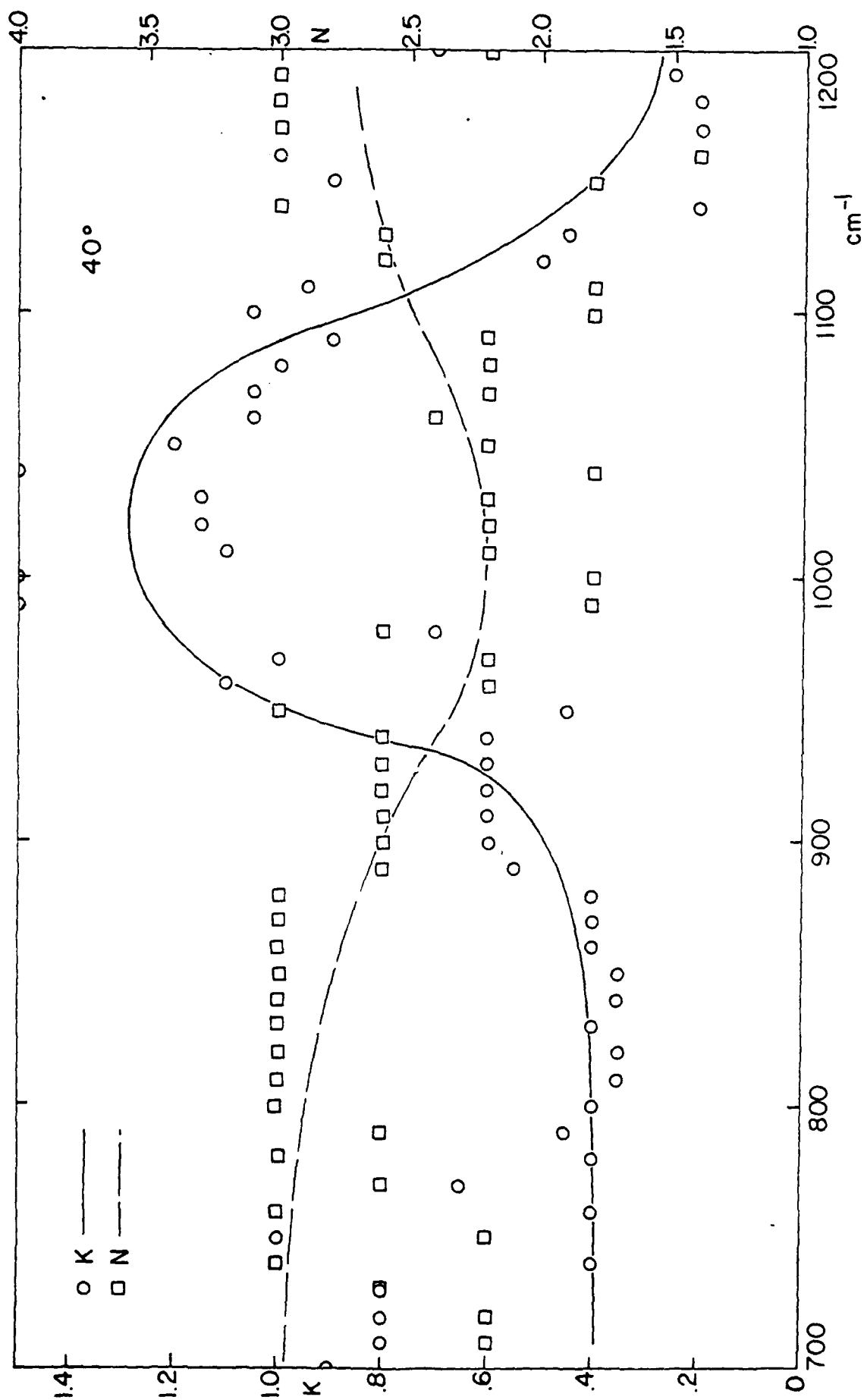


Figure 4 Refractive index and absorption coefficient for boron carbide as measured for 40° degrees incidence

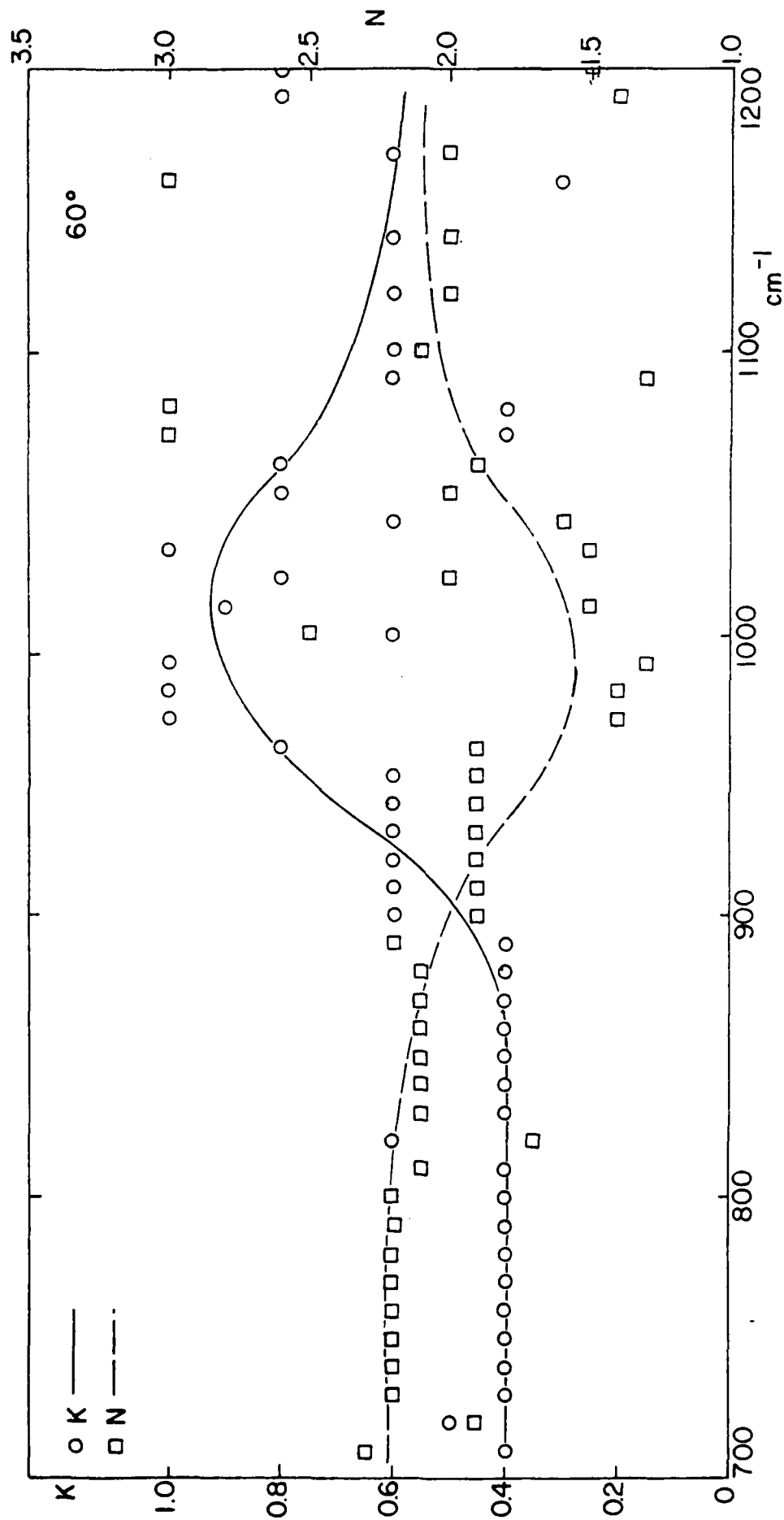


Figure 5 Refractive index and absorption coefficient for boron carbide as measured for 60° degrees incidence

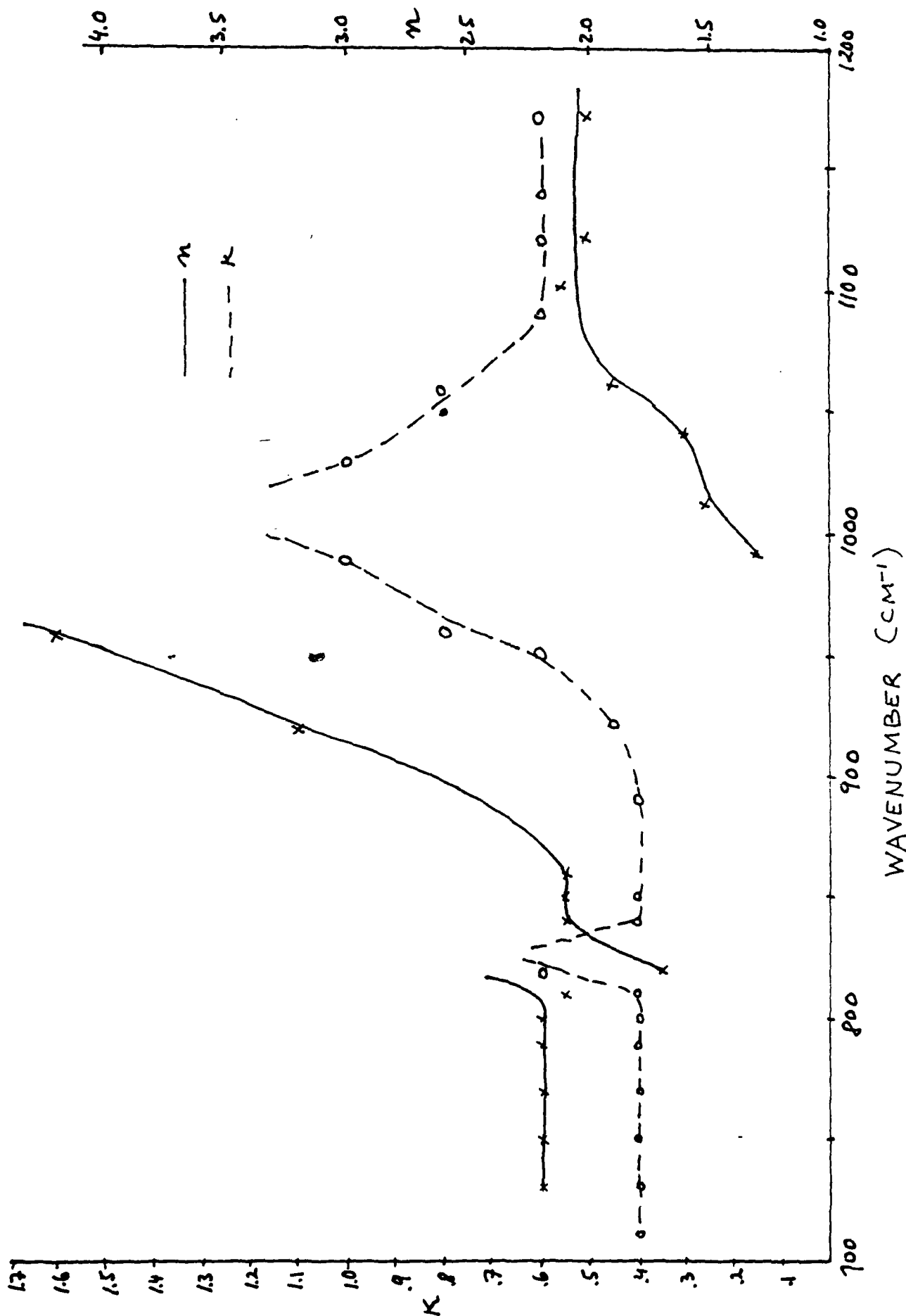


Figure 6 Refractive index and absorption coefficient for boron carbide as measured for 50° incidence

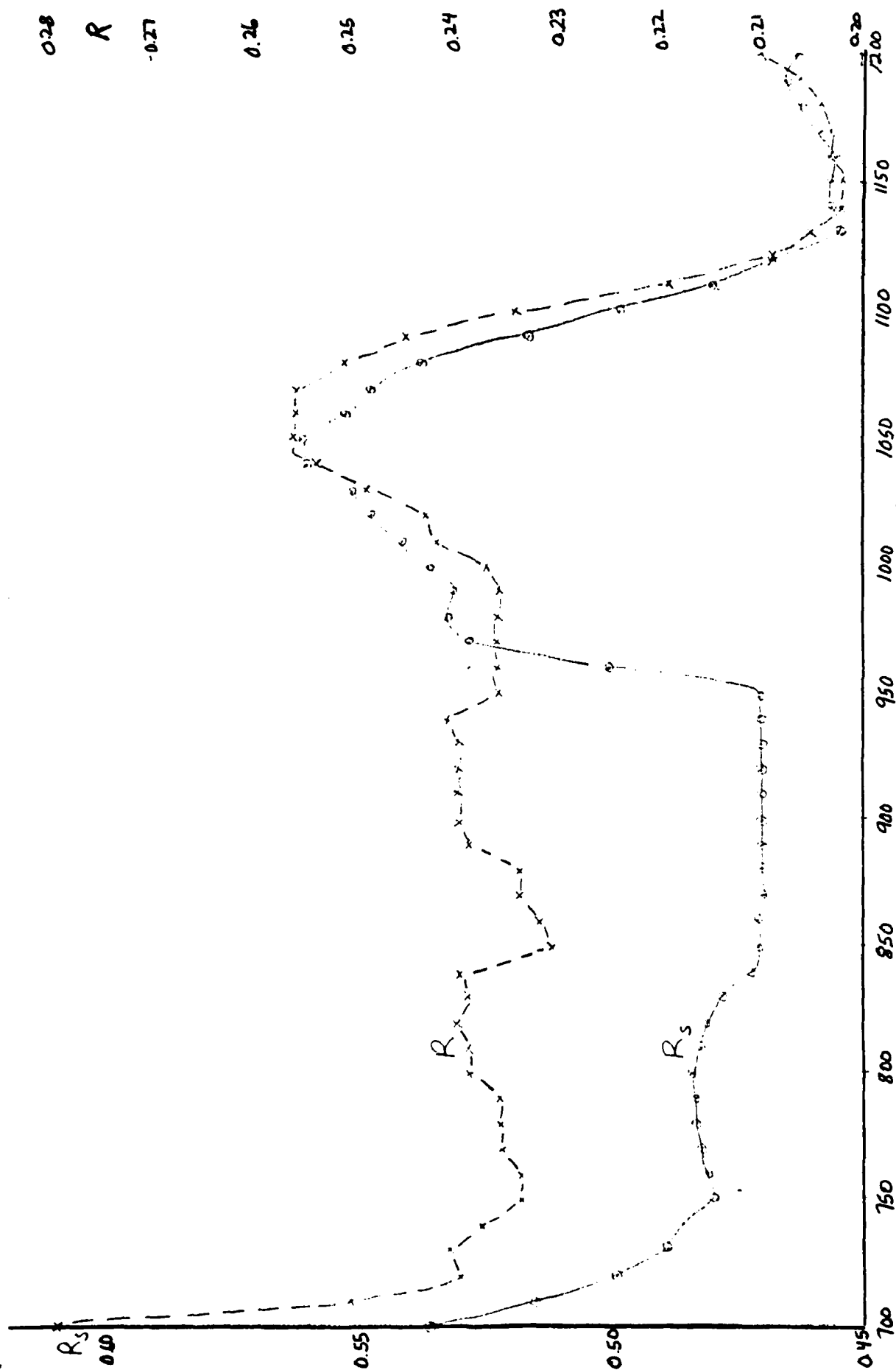


Figure 7 Reflectivities from which Figure 6 were calculated

APPENDIX I

COMPUTER PROGRAM FOR THE CALCULATION OF THE OPTICAL
CONSTANTS FROM REFLECTIVITIES AND TABULATIONS

MICHIGAN TERMINAL SYSTEM FORTRAN G(21.8)

MAIN

38-31-79

39:53:13

```

0001 RFAL*4 N(21),K(13),RS(21),RP(21),R(21)
0002 DO 10 I=1,14
0003 READ (5,3)K(I)
0004 FORMAT(F5.2)
0005 7
0006 10 CONTINUE
0007 DO 20 J=1,21
0008 READ (5,4)N(J)
0009 FORMAT(F7.2)
0010 4
0011 20 CONTINUE
0012 CALL PLTXMX(72.)
0013 ORX1=3.
0014 ORX2=ORX1+13.
0015 ORX3=ORX2+13.
0016 YLEN=7.5
0017 ORY=12.5
0018 1 READ(5,2,END=999)PHI
0019 2 FORMAT(F5.3)
0020 WRITE(6,101)PHI
0021 101 FORMAT('1.62X.. PHI=',F3.0//')
0022 PHI=PHI*3.1415925/180.
0023 SINP=SIN(PHI)
0024 SINP2=SINP**2
0025 COSP=COS(PHI)
0026 COSP2=COSP**2
0027 TAND=TAN(PHI)
0028 TANDP2=TAND**2
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0984 C
0985 C
0986 C
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0991 C
0992 C
0993 C
0994 C
0995 C
0996 C
0997 C
0998 C
0999 C
1000 C

```

```

0049      DO 200 J=1,21
0050          A=N(J)**2*(1-K(I)**2)
0051          E1=((A-SINP2+SQR((A-SINP2)**2+4*(N(J)**4)*(K(I)**2)))/2)
0052          IF (F1.LE.0)E1=1.E-50
0053          F=SQR(E1)
0054          F1=((SQR((A-SINP2)**2+4*(N(J)**4)*(K(I)**2))-A+SINP2)/2)
0055          IF (F1.LE.0)F1=1.E-50
0056          F=SQR(F1)
0057          G=2*K(I)*(N(J)**2)
0058          RS(J)=((COSP-E)**2+F**2)/((COSP+E)**2+F**2)
0059          RD(J)=((A*COSP-E)**2+(G*COSP-F)**2)/((A*COSP+E)**2+(G*COSP+F)**2)
0060          R(J)=(RS(J)+RD(J))/2
0061      CONTINUE

      200      C
      C
      C          OUTPUT TABLE OF VALUES
      C
      WRITE(6,105)K(I)
      105      FORMAT(' ',6TX,' K=',F4.1/)
      WRITE(6,102)
      102      FORMAT(' ',3RX,' N',17X,' R',16X,' RS',15X,' RP',14X,' ')
      1.9X,' '
      WRITE(6,103)(N(J),P(J),RS(J),RP(J),J=1,21)
      103      FORMAT(' ',34X,F9.5,F9.5,9X,F9.5,9X,F9.5)
      C
      C          PLOT EACH CURVE ON THE APPROPRIATE GRID

```

```

86.00
87.00
88.00
89.00
90.00
91.00
92.00
93.00
94.00
95.00
96.00
97.00
98.00
99.00
100.00
101.00
102.00
103.00
104.00
105.00
106.00
107.00
108.00
109.00
110.00

```

```

0068      C
0069      CALL PLTOFS(-2.,0.4,0.,1/YLEN,ORX1,ORY)
0070      CALL PLTLOG(2)
0071      CALL PFLINE(N,RS,21,1,1)
0072      CALL PLTRFC
0073      CALL PLTOFS(-2.,0.4,0.,1/YLEN,ORX2,ORY)
0074      CALL PLTLOG(2)
0075      CALL PFLINE(N,RP,21,1,1)
0076      CALL PLTRFC
0077      CALL PLTOFS(-2.,0.4,0.,1/YLEN,ORX3,ORY)
0078      CALL PLTLOG(2)
0079      CALL PFLINE(N,R,21,1,1)
0080      CALL PLTRFC
0081      100 CONTINUE
0082      CALL PLTFND
0083      GO TO 1
0084      999 CONTINUE
0085      END
0086      *OPTIONS IN EFFECT* ID,FRCDIC,SOURCE,NOLIST,NODECK,LOAD,NOMAP
0087      *OPTIONS IN EFFECT* NAME = MAIN, LINECNT = 57
0088      *STATISTICS* SOURCE STATEMENTS = 84, PROGRAM SIZE = 3590
0089      *STATISTICS* NO DIAGNOSTICS GENERATED

```

NO STATEMENTS FLAGGED IN THE ABOVE COMPILATIONS.

PHI=20.
K= 0.0

N	R	RS	RP
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	0.21648	0.40751	0.02544
0.60000	0.06593	0.09723	0.03463
0.80000	0.01270	0.01695	0.00846
1.00000	0.00000	0.00000	0.00000
2.00000	0.11144	0.12547	0.09742
4.00000	0.35996	0.38242	0.33749
6.00000	0.50997	0.53115	0.48878
8.00000	0.60464	0.62347	0.58581
10.00000	0.66911	0.68577	0.65244
20.00000	0.81834	0.82853	0.80815
40.00000	0.90466	0.91029	0.89903
60.00000	0.93539	0.93927	0.93151
80.00000	0.95114	0.95410	0.94818
100.00000	0.96072	0.96311	0.95833

K= 0.1

N	R	RS	RP
0.01000	0.99834	0.99888	0.99780
0.02000	0.99672	0.99785	0.99560
0.04000	0.99336	0.99560	0.99113
0.06000	0.98990	0.99332	0.98649
0.08000	0.98626	0.99095	0.98158
0.10000	0.98237	0.98847	0.97627
0.20000	0.95391	0.97227	0.93555
0.40000	0.21945	0.41310	0.02579
0.60000	0.06722	0.09931	0.03512
0.80000	0.01330	0.01777	0.00883
1.00000	0.00003	0.00004	0.00002
2.00000	0.10997	0.12388	0.09606
4.00000	0.35803	0.38049	0.33558
6.00000	0.50821	0.52943	0.48699
8.00000	0.60309	0.62197	0.58422
10.00000	0.66774	0.68446	0.65103
20.00000	0.81751	0.82774	0.80728
40.00000	0.90420	0.90986	0.89855
60.00000	0.93507	0.93897	0.93117
80.00000	0.95090	0.95387	0.94792
100.00000	0.96052	0.96293	0.95812

K= 0.2

N	R	RS	RP
0.01000	0.99342	0.99561	0.99124
0.02000	0.98687	0.99123	0.98251
0.04000	0.97372	0.98244	0.96500
0.06000	0.96031	0.97350	0.94712
0.08000	0.94642	0.96432	0.92853
0.10000	0.93179	0.95477	0.90992
0.20000	0.83344	0.89502	0.77187
0.40000	0.22866	0.41194	0.04538
0.60000	0.07126	0.10550	0.03702
0.80000	0.01549	0.02076	0.01022
1.00000	0.00053	0.00067	0.00039

2.00000	0.10569	0.11927	0.09212
4.00000	0.35219	0.37462	0.32976
6.00000	0.50283	0.52415	0.48151
8.00000	0.59835	0.61736	0.57933
10.00000	0.66356	0.68043	0.64669
20.00000	0.81496	0.82532	0.80461
40.00000	0.90279	0.90853	0.89776
60.00000	0.93410	0.93806	0.93015
80.00000	0.95016	0.95318	0.94714
100.00000	0.95992	0.96236	0.95748

K = 0.4

N	R	RS	RP
0.01000	0.97403	0.98257	0.96543
0.02000	0.94868	0.96540	0.93196
0.04000	0.89980	0.93173	0.86787
0.06000	0.85282	0.89873	0.80691
0.08000	0.80729	0.86615	0.74843
0.10000	0.76286	0.83378	0.69195
0.20000	0.55061	0.66909	0.43213
0.40000	0.22576	0.37094	0.12058
0.60000	0.08831	0.12534	0.05129
0.80000	0.02999	0.03992	0.02006
1.00000	0.00922	0.01169	0.00674
2.00000	0.00141	0.10381	0.07901
4.00000	0.32785	0.35011	0.30559
6.00000	0.47958	0.50129	0.45787
8.00000	0.57753	0.59714	0.55792
10.00000	0.64505	0.66257	0.62753
20.00000	0.80353	0.81445	0.79262
40.00000	0.89644	0.90253	0.89035
60.00000	0.92972	0.93392	0.92551
80.00000	0.94681	0.95002	0.94359
100.00000	0.95722	0.95982	0.95462

K = 0.6

N	R	RS	RP
0.01000	0.94260	0.96122	0.92398
0.02000	0.88901	0.92399	0.85403
0.04000	0.79274	0.85411	0.73137
0.06000	0.70986	0.79016	0.62956
0.08000	0.63876	0.73180	0.54572
0.10000	0.57780	0.67866	0.47694
0.20000	0.37600	0.47612	0.27589
0.40000	0.19568	0.25500	0.13636
0.60000	0.11220	0.14419	0.08022
0.80000	0.06818	0.08576	0.05060
1.00000	0.04683	0.05765	0.03601
2.00000	0.08607	0.09828	0.07386
4.00000	0.28604	0.30775	0.26473
6.00000	0.43407	0.45634	0.41181
8.00000	0.53479	0.55546	0.51411
10.00000	0.60610	0.62488	0.58731
20.00000	0.77850	0.79060	0.76639
40.00000	0.88231	0.88917	0.87544
60.00000	0.91991	0.92468	0.91514
80.00000	0.93931	0.94296	0.93565
100.00000	0.95114	0.95410	0.94818

K = 0.8

N	R	RS	RP
0.01000	0.90071	0.93218	0.86923
0.02000	0.81372	0.86954	0.75789

0.04000	0.67359	0.75983	0.59735
0.06000	0.57045	0.66950	0.47141
0.08000	0.49413	0.59572	0.39253
0.10000	0.43645	0.53535	0.33755
0.20000	0.28272	0.35384	0.21161
0.40000	0.17829	0.21822	0.13837
0.60000	0.14084	0.16979	0.11288
0.80000	0.12506	0.14758	0.10255
1.00000	0.11922	0.13902	0.09943
2.00000	0.14245	0.16020	0.12470
4.00000	0.25327	0.27454	0.23200

0.04300
0.06300
0.08000
0.10300
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.67359
0.57045
0.49413
0.43645
0.28272
0.17829
0.14084
0.12506
0.11922
0.14245
0.25327
0.36419
0.45462
0.52563
0.71847
0.84659
0.89477
0.91995
0.93542

0.75983
0.66950
0.59572
0.53535
0.35384
0.21822
0.16879
0.14758
0.13902
0.16020
0.27454
0.38676
0.47670
0.54651
0.73321
0.85535
0.90095
0.92472
0.93930

0.58735
0.47141
0.39253
0.33755
0.21161
0.13837
0.11288
0.10255
0.09943
0.12470
0.23200
0.34162
0.43254
0.50475
0.70373
0.83783
0.88859
0.91519
0.93154

K = 1.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.85038
0.73026
0.56215
0.45791
0.38967
0.34218
0.23076
0.17805
0.17561
0.18627
0.20114
0.27790
0.38471
0.45253
0.50049
0.53687
0.64154
0.72956
0.77272
0.79974
0.81875

PS
0.89635
0.80562
0.66116
0.55697
0.48116
0.42472
0.28222
0.20969
0.20202
0.21096
0.22522
0.30190
0.40843
0.47538
0.52242
0.55793
0.65936
0.74391
0.78513
0.81086
0.82894

PD
0.80441
0.65491
0.46314
0.35886
0.29818
0.25964
0.17930
0.14642
0.14919
0.16158
0.17705
0.25389
0.36099
0.42967
0.47857
0.51582
0.62371
0.71522
0.76030
0.78861
0.80856

K = 1.5

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000

R
0.73465
0.53232
0.36642
0.29098
0.24943
0.22439
0.18912
0.22194
0.27287
0.32273
0.36904
0.55254
0.76468
0.86492
0.91501
0.94239

PS
0.78507
0.63245
0.45320
0.35968
0.30547
0.27193
0.22006
0.24799
0.29850
0.34820
0.39419
0.57401
0.77776
0.87283
0.92010
0.94588

PD
0.62423
0.43219
0.27964
0.22228
0.17340
0.17686
0.15818
0.19588
0.24723
0.29725
0.34389
0.53108
0.75161
0.85701
0.90991
0.93889

20.00000
40.00000
60.00000
80.00000
100.00000

0.98434
0.99600
0.99821
0.99899
0.99936

0.98531
0.99625
0.99832
0.99906
0.99940

0.98338
0.99575
0.99810
0.99893
0.99932

K = 2.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.56268
0.39129
0.26405
0.21659
0.19582
0.18739
0.20520
0.28747
0.36261
0.42693
0.48268
0.67975
0.86025
0.92690
0.95609
0.97097
0.99241
0.99808
0.99914
0.99952
0.99969

RS
0.66153
0.48258
0.32506
0.26180
0.23287
0.21988
0.23119
0.31270
0.38752
0.45108
0.50579
0.69655
0.86840
0.93130
0.95876
0.97275
0.99288
0.99820
0.99920
0.99955
0.99971

RP
0.46384
0.30000
0.20304
0.17137
0.15877
0.15490
0.17921
0.26224
0.33770
0.40278
0.45958
0.66294
0.85210
0.92250
0.95341
0.96919
0.99194
0.99796
0.99909
0.99949
0.99967

K = 3.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.36494
0.24618
0.18653
0.18094
0.19003
0.20444
0.28569
0.41068
0.49857
0.56613
0.62091
0.79242
0.92010
0.96017
0.97658
0.98468
0.99605
0.99901
0.99956
0.99975
0.99984

RS
0.45186
0.30205
0.22063
0.20883
0.21587
0.22948
0.31036
0.43465
0.52098
0.58676
0.63977
0.80402
0.92489
0.96260
0.97802
0.98563
0.99630
0.99907
0.99959
0.99977
0.99985

RP
0.27802
0.10030
0.15243
0.15286
0.16418
0.17941
0.26103
0.38672
0.47616
0.54549
0.60205
0.78081
0.91532
0.95774
0.97514
0.98374
0.99581
0.99894
0.99953
0.99974
0.99983

K = 4.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000

R
0.26155
0.19069
0.18175
0.20490
0.23280
0.26020
0.37041

RS
0.32247
0.22727
0.20804
0.22951
0.25714
0.28456
0.39457

RP
0.20063
0.15410
0.15545
0.18030
0.20846
0.23584
0.34624

0.40000	0.50511	0.52720	0.48302
0.60000	0.59321	0.60998	0.57045
0.80000	0.65237	0.66999	0.63476
1.00000	0.70110	0.71680	0.68541
2.00000	0.84492	0.85393	0.83601
4.00000	0.94296	0.94641	0.93951
6.00000	0.97199	0.97371	0.97028
8.00000	0.98363	0.98464	0.98262
10.00000	0.98933	0.98999	0.98867
20.00000	0.99726	0.99743	0.99739
40.00000	0.99931	0.99935	0.99927
60.00000	0.99969	0.99971	0.99967
80.00000	0.99983	0.99984	0.99982
100.00000	0.99989	0.99990	0.99988

K= 6.0

N	R	RS	RO
0.01000	0.18333	0.21713	0.14553
0.02000	0.18359	0.20895	0.15823
0.04000	0.24108	0.26518	0.21699
0.06000	0.29550	0.31972	0.27129
0.08000	0.34065	0.36480	0.31650
0.10000	0.37931	0.40224	0.35438
0.20000	0.50304	0.52504	0.48104
0.40000	0.62957	0.64791	0.61122
0.60000	0.70184	0.71743	0.68625
0.80000	0.75202	0.76544	0.73850
1.00000	0.79006	0.80171	0.77842
2.00000	0.89619	0.90232	0.89007
4.00000	0.96318	0.96542	0.96093
6.00000	0.98212	0.98322	0.98102
8.00000	0.98960	0.99024	0.98896
10.00000	0.99324	0.99365	0.99282
20.00000	0.99827	0.99838	0.99816
40.00000	0.99957	0.99959	0.99954
60.00000	0.99981	0.99982	0.99979
80.00000	0.99989	0.99990	0.99988
100.00000	0.99993	0.99993	0.99993

K= 8.0

N	R	RS	RO
0.01000	0.17833	0.20434	0.15232
0.02000	0.22602	0.25002	0.20201
0.04000	0.31814	0.34228	0.29401
0.06000	0.38445	0.40826	0.36064
0.08000	0.43419	0.45741	0.41097
0.10000	0.47338	0.49594	0.45082
0.20000	0.59348	0.61298	0.57398
0.40000	0.70540	0.72081	0.68998
0.60000	0.76627	0.77902	0.75353
0.80000	0.80750	0.81828	0.79673
1.00000	0.83824	0.84746	0.82901
2.00000	0.92174	0.92641	0.91706
4.00000	0.97265	0.97433	0.97098
6.00000	0.98678	0.98760	0.98597
8.00000	0.99232	0.99280	0.99185
10.00000	0.99501	0.99532	0.99470
20.00000	0.99873	0.99881	0.99865
40.00000	0.99968	0.99970	0.99966
60.00000	0.99986	0.99987	0.99985
80.00000	0.99992	0.99992	0.99991
100.00000	0.99995	0.99995	0.99995

K = 1.0

N	R	RS	RD
0.01000	0.99314	0.99543	0.99386
0.02000	0.73221	0.80716	0.65725
0.04000	0.56451	0.66338	0.46564
0.06000	0.46014	0.55935	0.36093
0.08000	0.39166	0.48348	0.29984
0.10000	0.34392	0.42687	0.26097
0.20000	0.23164	0.28344	0.17983
0.40000	0.17790	0.20965	0.14614
0.60000	0.17476	0.20119	0.14832
0.80000	0.18488	0.20954	0.16022
1.00000	0.19931	0.22334	0.17528
2.00000	0.27452	0.29845	0.25059
4.00000	0.37932	0.40304	0.35561
6.00000	0.44561	0.46853	0.42269
8.00000	0.49227	0.51433	0.47022
10.00000	0.52750	0.54875	0.50625
20.00000	0.62773	0.64601	0.60946
40.00000	0.71040	0.72553	0.69527
60.00000	0.75080	0.76419	0.73741
80.00000	0.77674	0.78894	0.76454
100.00000	0.79586	0.80715	0.78456

-9-

I
I
I

PHI= 0.

K= 0.0

N	R	PS	RD
0.01000	0.96079	0.96079	0.96079
0.02000	0.92311	0.92311	0.92311
0.04000	0.85207	0.85207	0.85207
0.06000	0.78640	0.78640	0.78640
0.08000	0.72565	0.72565	0.72565
0.10000	0.66942	0.66942	0.66942
0.20000	0.44444	0.44444	0.44444
0.40000	0.18367	0.18367	0.18367
0.60000	0.06250	0.06250	0.06250
0.80000	0.01235	0.01235	0.01235
1.00000	0.00000	0.00000	0.00000
2.00000	0.11111	0.11111	0.11111
4.00000	0.36000	0.36000	0.36000
6.00000	0.51020	0.51020	0.51020
8.00000	0.60494	0.60494	0.60494
10.00000	0.66942	0.66942	0.66942
20.00000	0.81859	0.81859	0.81859
40.00000	0.90482	0.90482	0.90482
60.00000	0.93550	0.93550	0.93550
80.00000	0.95123	0.95123	0.95123
100.00000	0.96079	0.96079	0.96079

K= 0.1

N	R	PS	RD
0.01000	0.96079	0.96079	0.96079
0.02000	0.92311	0.92311	0.92311
0.04000	0.85207	0.85207	0.85207
0.06000	0.78641	0.78641	0.78641
0.08000	0.72567	0.72567	0.72567
0.10000	0.66945	0.66945	0.66945
0.20000	0.44460	0.44460	0.44460
0.40000	0.18434	0.18434	0.18434
0.60000	0.06382	0.06382	0.06382
0.80000	0.01429	0.01429	0.01429
1.00000	0.00249	0.00249	0.00249
2.00000	0.11504	0.11504	0.11504
4.00000	0.36407	0.36407	0.36407
6.00000	0.51378	0.51378	0.51378
8.00000	0.60804	0.60804	0.60804
10.00000	0.67213	0.67213	0.67213
20.00000	0.82022	0.82022	0.82022
40.00000	0.90572	0.90572	0.90572
60.00000	0.93612	0.93612	0.93612
80.00000	0.95170	0.95170	0.95170
100.00000	0.96117	0.96117	0.96117

K= 0.2

N	R	PS	RD
0.01000	0.96079	0.96079	0.96079
0.02000	0.92311	0.92311	0.92311
0.04000	0.85208	0.85208	0.85208
0.06000	0.78643	0.78643	0.78643
0.08000	0.72571	0.72571	0.72571

0.10000	0.66953	0.66953	0.66953
0.20000	0.44506	0.44506	0.44506
0.40000	0.18633	0.18633	0.18633
0.60000	0.06774	0.06774	0.06774
0.80000	0.02009	0.02009	0.02009
1.00000	0.00990	0.00990	0.00990
2.00000	0.12664	0.12664	0.12664
4.00000	0.37598	0.37598	0.37598
6.00000	0.52419	0.52419	0.52419
8.00000	0.61704	0.61704	0.61704
10.00000	0.68000	0.68000	0.68000
20.00000	0.82495	0.82495	0.82495
40.00000	0.90831	0.90831	0.90831
60.00000	0.93790	0.93790	0.93790
80.00000	0.95306	0.95306	0.95306
100.00000	0.96227	0.96227	0.96227

K= 0.4

N	R	RS	RP
0.01000	0.96079	0.96079	0.96079
0.02000	0.92311	0.92311	0.92311
0.04000	0.85211	0.85211	0.85211
0.06000	0.78651	0.78651	0.78651
0.08000	0.72589	0.72589	0.72589
0.10000	0.66986	0.66986	0.66986
0.20000	0.44690	0.44690	0.44690
0.40000	0.19420	0.19420	0.19420
0.60000	0.08313	0.08313	0.08313
0.80000	0.04260	0.04260	0.04260
1.00000	0.03846	0.03846	0.03846
2.00000	0.17012	0.17012	0.17012
4.00000	0.41945	0.41945	0.41945
6.00000	0.56172	0.56172	0.56172
8.00000	0.64928	0.64928	0.64928
10.00000	0.70903	0.70903	0.70903
20.00000	0.84158	0.84158	0.84158
40.00000	0.91740	0.91740	0.91740
60.00000	0.94415	0.94415	0.94415
80.00000	0.95781	0.95781	0.95781
100.00000	0.96610	0.96610	0.96610

K= 0.6

N	R	RS	RP
0.01000	0.96079	0.96079	0.96079
0.02000	0.92312	0.92312	0.92312
0.04000	0.85215	0.85215	0.85215
0.06000	0.78665	0.78665	0.78665
0.08000	0.72619	0.72619	0.72619
0.10000	0.67040	0.67040	0.67040
0.20000	0.44995	0.44995	0.44995
0.40000	0.20698	0.20698	0.20698
0.60000	0.10767	0.10767	0.10767
0.80000	0.07792	0.07792	0.07792
1.00000	0.08257	0.08257	0.08257
2.00000	0.23372	0.23372	0.23372
4.00000	0.47984	0.47984	0.47984
6.00000	0.61265	0.61265	0.61265
8.00000	0.69243	0.69243	0.69243
10.00000	0.74522	0.74522	0.74522
20.00000	0.86325	0.86325	0.86325

40.00000
60.00000
80.00000
100.00000

0.92911
0.95216
0.96390
0.97102

0.92911
0.95216
0.96390
0.97102

0.92911
0.95216
0.96390
0.97102

-12-

K= 0.8

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.96079
0.92313
0.85221
0.78684
0.72661
0.67116
0.45415
0.22420
0.13991
0.12319
0.13793
0.30796
0.54597
0.66685
0.73762
0.78378
0.88522
0.94085
0.96017
0.96997
0.97590

RS
0.96079
0.92313
0.85221
0.78684
0.72661
0.67116
0.45415
0.22420
0.13991
0.12319
0.13793
0.30796
0.54597
0.66685
0.73762
0.78378
0.88522
0.94085
0.96017
0.96997
0.97591

RP
0.96079
0.92313
0.85221
0.78684
0.72661
0.67116
0.45415
0.22420
0.13991
0.12319
0.13793
0.30796
0.54597
0.66685
0.73762
0.78378
0.88522
0.94085
0.96017
0.96997
0.97591

K= 1.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.96079
0.92314
0.85229
0.78708
0.72715
0.67213
0.45946
0.24528
0.17808
0.17526
0.20000
0.38462
0.60976
0.71765
0.77931
0.81900
0.90487
0.95123
0.96722
0.97531
0.98020

RS
0.96079
0.92314
0.85229
0.78708
0.72715
0.67213
0.45946
0.24528
0.17808
0.17526
0.20000
0.38462
0.60976
0.71765
0.77931
0.81900
0.90488
0.95123
0.96722
0.97531
0.98020

RP
0.96079
0.92314
0.85229
0.78708
0.72715
0.67213
0.45946
0.24528
0.17808
0.17526
0.20000
0.38462
0.60976
0.71765
0.77931
0.81900
0.90488
0.95123
0.96722
0.97531
0.98020

K= 1.5

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
0.96080
0.92317
0.85256
0.78793
0.72900

RS
0.96080
0.92317
0.85256
0.78793
0.72900

RP
0.96080
0.92317
0.85256
0.78793
0.72900

0.10000	0.67546	0.67546	0.67546
0.20000	0.47712	0.47712	0.47712
0.40000	0.31035	0.31035	0.31035
0.60000	0.28783	0.28783	0.28783
0.80000	0.31624	0.31624	0.31624
1.00000	0.36000	0.36000	0.36000
2.00000	0.55556	0.55556	0.55556
4.00000	0.73770	0.73770	0.73770
6.00000	0.81538	0.81538	0.81538
8.00000	0.85778	0.85778	0.85778
10.00000	0.88439	0.88439	0.88439
20.00000	0.94034	0.94034	0.94034
40.00000	0.96970	0.96970	0.96970
60.00000	0.97970	0.97970	0.97970
80.00000	0.98473	0.98473	0.98473
100.00000	0.98777	0.98777	0.98777

K= 2.0

N	R	RS	RP
0.01000	0.96080	0.96081	0.96080
0.02000	0.92323	0.92323	0.92322
0.04000	0.85294	0.85294	0.85294
0.06000	0.78910	0.78911	0.78910
0.08000	0.73154	0.73154	0.73154
0.10000	0.68000	0.68000	0.68000
0.20000	0.50000	0.50000	0.50000
0.40000	0.38462	0.38462	0.38462
0.60000	0.40000	0.40000	0.40000
0.80000	0.44828	0.44828	0.44828
1.00000	0.50000	0.50000	0.50000
2.00000	0.68000	0.68000	0.68000
4.00000	0.82022	0.82022	0.82022
6.00000	0.87565	0.87565	0.87565
8.00000	0.90504	0.90504	0.90504
10.00000	0.92322	0.92322	0.92322
20.00000	0.96080	0.96080	0.96080
40.00000	0.98020	0.98020	0.98020
60.00000	0.98676	0.98676	0.98676
80.00000	0.99005	0.99005	0.99005
100.00000	0.99203	0.99203	0.99203

K= 3.0

N	R	RS	RP
0.01000	0.96082	0.96083	0.96082
0.02000	0.92337	0.92337	0.92337
0.04000	0.85401	0.85402	0.85401
0.06000	0.79239	0.79239	0.79239
0.08000	0.73856	0.73856	0.73856
0.10000	0.69231	0.69231	0.69231
0.20000	0.55556	0.55556	0.55556
0.40000	0.52941	0.52941	0.52941
0.60000	0.58621	0.58621	0.58621
0.80000	0.64444	0.64444	0.64444
1.00000	0.69231	0.69231	0.69231
2.00000	0.82222	0.82222	0.82222
4.00000	0.90533	0.90533	0.90533
6.00000	0.93566	0.93566	0.93566
8.00000	0.95129	0.95129	0.95129
10.00000	0.96082	0.96082	0.96082
20.00000	0.98020	0.98020	0.98020

40.00000
60.00000
80.00000
100.00000

0.99005
0.99336
0.99501
0.99601

0.99005
0.99336
0.99501
0.99601

0.99005
0.99336
0.99501
0.99601

-14-

K= 4.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

F
0.96085
0.92358
0.85549
0.79682
0.74779
0.70803
0.61539
0.64602
0.71154
0.76261
0.80000
0.89041
0.94306
0.96160
0.97104
0.97676
0.98831
0.99413
0.99609
0.99706
0.99765

PS
0.96085
0.92358
0.85549
0.79682
0.74779
0.70803
0.61538
0.64602
0.71154
0.76261
0.80000
0.89041
0.94306
0.96160
0.97104
0.97676
0.98831
0.99414
0.99609
0.99706
0.99765

RP
0.96085
0.92358
0.85549
0.79682
0.74779
0.70803
0.61539
0.64602
0.71154
0.76261
0.80000
0.89041
0.94306
0.96160
0.97104
0.97676
0.98831
0.99414
0.99609
0.99706
0.99765

K= 6.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

F
0.96093
0.92416
0.85955
0.80849
0.77091
0.74522
0.72222
0.79275
0.84576
0.87823
0.90000
0.94771
0.97338
0.98216
0.98658
0.98925
0.99461
0.99730
0.99820
0.99865
0.99892

FS
0.96093
0.92416
0.85955
0.80849
0.77091
0.74522
0.72222
0.79275
0.84576
0.87823
0.90000
0.94771
0.97338
0.98216
0.98658
0.98925
0.99461
0.99730
0.99820
0.99865
0.99892

RP
0.96093
0.92416
0.85955
0.80849
0.77090
0.74522
0.72222
0.79275
0.84576
0.87823
0.90000
0.94771
0.97338
0.98216
0.98658
0.98925
0.99461
0.99730
0.99820
0.99865
0.99892

K= 8.0

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
0.96103
0.92495
0.86486
0.82275
0.79695

RS
0.96104
0.92495
0.86486
0.82275
0.79696

RP
0.96103
0.92495
0.86486
0.82275
0.79695

I
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.78378
0.80000
0.86885
0.90625
0.92760
0.94118
0.96981
0.98475
0.98980
0.99234
0.99387
0.99693
0.99846
0.99897
0.99923
0.99938

0.78378
0.80000
0.86885
0.90625
0.92760
0.94118
0.96981
0.98475
0.98980
0.99234
0.99387
0.99693
0.99846
0.99897
0.99923
0.99938

0.78378
0.80000
0.86885
0.90625
0.92760
0.94118
0.96981
0.98475
0.98980
0.99234
0.99387
0.99693
0.99846
0.99897
0.99923
0.99938

K= 0.0

N	R	RS	RP
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	0.42685	0.66737	0.18633
0.40000	0.18440	0.21551	0.15329
0.60000	0.06265	0.06932	0.05599
0.80000	0.01236	0.01333	0.01140
1.00000	0.00000	0.00000	0.00000
2.00000	0.11113	0.11455	0.10772
4.00000	0.36000	0.36551	0.35448
6.00000	0.51019	0.51540	0.50498
8.00000	0.60492	0.60955	0.60029
10.00000	0.66940	0.67350	0.66530
20.00000	0.81858	0.82108	0.81607
40.00000	0.90481	0.90619	0.90342
60.00000	0.93549	0.93645	0.93454
80.00000	0.95122	0.95195	0.95049
100.00000	0.96078	0.96137	0.96020

K= 0.1

N	R	RS	RP
0.01000	0.99969	0.99983	0.99954
0.02000	0.99864	0.99912	0.99816
0.04000	0.99432	0.99629	0.99237
0.06000	0.98647	0.99131	0.98162
0.08000	0.97373	0.98370	0.96376
0.10000	0.95322	0.97247	0.93398
0.20000	0.44151	0.65361	0.22941
0.40000	0.18512	0.21585	0.15439
0.60000	0.06398	0.07069	0.05726
0.80000	0.01431	0.01542	0.01321
1.00000	0.00250	0.00265	0.00234
2.00000	0.11506	0.11856	0.11156
4.00000	0.36407	0.36959	0.35854
6.00000	0.51376	0.51895	0.50857
8.00000	0.60802	0.61263	0.60341
10.00000	0.67211	0.67619	0.66804
20.00000	0.82021	0.82270	0.81772
40.00000	0.90571	0.90708	0.90433
60.00000	0.93611	0.93706	0.93517
80.00000	0.95169	0.95241	0.95097
100.00000	0.96116	0.96175	0.96058

K= 0.2

N	R	RS	RP
0.01000	0.99934	0.99958	0.99909
0.02000	0.99726	0.99819	0.99633
0.04000	0.98869	0.99257	0.98492
0.06000	0.97325	0.98274	0.96377
0.08000	0.94873	0.96784	0.92962

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.91087
0.45834
0.18725
0.06792
0.02012
0.00991
0.12666
0.37597
0.52417
0.61702
0.67998
0.82493
0.90830
0.93790
0.95305
0.96226

0.94628
0.62812
0.21693
0.07480
0.02163
0.01050
0.13040
0.38151
0.52932
0.62157
0.68399
0.82736
0.90964
0.93882
0.95375
0.96283

0.87547
0.28855
0.15758
0.06103
0.01861
0.00932
0.12292
0.37043
0.51903
0.61248
0.67598
0.82250
0.90696
0.93698
0.95235
0.96170

K = 0.4

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

P
0.99864
0.99452
0.97766
0.94813
0.90382
0.84237
0.46868
0.19541
0.08335
0.04266
0.03849
0.17015
0.41944
0.56171
0.64926
0.70801
0.84157
0.91739
0.94414
0.95781
0.96610

PS
0.99910
0.99636
0.98524
0.96610
0.93795
0.89946
0.58433
0.22186
0.09078
0.04550
0.04054
0.17464
0.42498
0.56665
0.65354
0.71175
0.84379
0.91860
0.94497
0.95844
0.96661

PD
0.99818
0.99269
0.97008
0.93017
0.86969
0.78529
0.35302
0.16896
0.07592
0.03983
0.03645
0.16565
0.41390
0.55676
0.64497
0.70427
0.83935
0.91618
0.94731
0.95718
0.96559

K = 0.6

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000

P
0.99796
0.99181
0.96703
0.92522
0.86667
0.79418
0.46905
0.20827
0.10793
0.07801
0.08263
0.23374
0.47983
0.61264
0.69241
0.74520
0.86323

PS
0.99865
0.99455
0.97809
0.95033
0.91113
0.86093
0.55537
0.23132
0.11599
0.08239
0.08634
0.23900
0.48523
0.61723
0.69630
0.74856
0.86518

PD
0.99728
0.98908
0.95598
0.90011
0.82222
0.72744
0.38270
0.18522
0.09987
0.07363
0.07801
0.22848
0.47443
0.60804
0.68851
0.74195
0.86129

40.00000
60.00000
80.00000
100.00000

0.92910
0.95216
0.96390
0.97101

0.93015
0.95287
0.96444
0.97145

0.92806
0.95144
0.96336
0.97058

-18-

K= 0.8

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99728
0.98914
0.95689
0.90485
0.83714
0.76131
0.46906
0.22539
0.14018
0.12331
0.13800
0.30797
0.54596
0.66683
0.73760
0.78377
0.88521
0.94084
0.96016
0.96997
0.97590

RS
0.99819
0.99275
0.97112
0.93564
0.88770
0.83015
0.53711
0.24555
0.14875
0.12901
0.14312
0.31371
0.55105
0.67098
0.74104
0.78669
0.88686
0.94172
0.96076
0.97042
0.97627

RP
0.99637
0.98552
0.94266
0.87406
0.78657
0.69248
0.40102
0.20523
0.13160
0.11760
0.13288
0.30223
0.54086
0.66268
0.73416
0.78084
0.88356
0.93997
0.95956
0.96952
0.97554

K= 1.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99661
0.98650
0.94733
0.88711
0.81421
0.73894
0.47071
0.24629
0.17834
0.17537
0.20007
0.38462
0.60974
0.71763
0.77929
0.81899
0.90487
0.95123
0.96721
0.97531
0.98020

RS
0.99775
0.99097
0.96441
0.92213
0.86761
0.80587
0.52619
0.26415
0.18723
0.18200
0.20615
0.39050
0.61440
0.72129
0.78228
0.82150
0.90625
0.95196
0.96771
0.97568
0.98050

RP
0.99547
0.98202
0.93026
0.85209
0.76081
0.67200
0.41524
0.22844
0.16945
0.16875
0.19399
0.37874
0.60507
0.71397
0.77631
0.81648
0.90348
0.95050
0.96672
0.97493
0.97990

K= 1.5

N
0.01000
0.02000
0.04000
0.06000
0.08000

P
0.99493
0.98010
0.92625
0.85347
0.77794

RS
0.99662
0.98660
0.94889
0.89372
0.83005

RP
0.99325
0.97359
0.90362
0.81323
0.72584

0.10000	0.70920	0.76557	0.65284
0.20000	0.48260	0.51905	0.44616
0.40000	0.31093	0.32481	0.29705
0.60000	0.28801	0.29694	0.27917
0.80000	0.31632	0.32367	0.30897
1.00000	0.36004	0.36677	0.35331
2.00000	0.55555	0.56077	0.55032
4.00000	0.73769	0.74116	0.73421
6.00000	0.81537	0.81793	0.81281
8.00000	0.85776	0.85978	0.85574
10.00000	0.88438	0.88605	0.88272
20.00000	0.94034	0.94122	0.93945
40.00000	0.96970	0.97016	0.96924
60.00000	0.97969	0.98000	0.97939
80.00000	0.98473	0.98496	0.98450
100.00000	0.98777	0.98795	0.98758

K= 2.0

N	P	RS	RP
0.01000	0.99328	0.99550	0.99106
0.02000	0.97405	0.98239	0.96572
0.04000	0.90935	0.93537	0.88332
0.06000	0.83213	0.87241	0.79185
0.08000	0.76015	0.80616	0.71414
0.10000	0.69837	0.74380	0.65294
0.20000	0.50280	0.52880	0.47679
0.40000	0.38494	0.39623	0.37364
0.60000	0.40010	0.40811	0.39208
0.80000	0.44831	0.45510	0.44152
1.00000	0.50001	0.50609	0.49393
2.00000	0.67998	0.68414	0.67583
4.00000	0.82021	0.82272	0.81770
6.00000	0.87564	0.87742	0.87385
8.00000	0.90504	0.90642	0.90365
10.00000	0.92322	0.92435	0.92209
20.00000	0.96080	0.96139	0.96021
40.00000	0.98020	0.98050	0.97990
60.00000	0.98675	0.98696	0.98655
80.00000	0.99005	0.99020	0.98990
100.00000	0.99203	0.99215	0.99191

K= 3.0

N	P	RS	RP
0.01000	0.99007	0.99331	0.98683
0.02000	0.96328	0.97455	0.95201
0.04000	0.88659	0.91439	0.85879
0.06000	0.81173	0.84588	0.77759
0.08000	0.74953	0.78266	0.71641
0.10000	0.69873	0.72833	0.66914
0.20000	0.55644	0.57188	0.54099
0.40000	0.52951	0.53742	0.52160
0.60000	0.58622	0.59214	0.58031
0.80000	0.64444	0.64934	0.63954
1.00000	0.69230	0.69652	0.68807
2.00000	0.82221	0.82472	0.81969
4.00000	0.90532	0.90670	0.90393
6.00000	0.93565	0.93660	0.93469
8.00000	0.95129	0.95202	0.95056
10.00000	0.96082	0.96141	0.96023
20.00000	0.98020	0.98050	0.97990

40.00000
60.00000
80.00000
100.00000

0.99005
0.99335
0.99501
0.99601

0.99020
0.99346
0.99509
0.99607

0.98990
0.99325
0.99494
0.99595

K = 4.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.98703
0.95442
0.87446
0.80620
0.75261
0.71070
0.61572
0.64604
0.71153
0.76260
0.79999
0.89040
0.94305
0.96160
0.97104
0.97675
0.98830
0.99413
0.99609
0.99706
0.99765

FS
0.99120
0.96762
0.90031
0.83309
0.77638
0.73094
0.62615
0.65177
0.71578
0.76602
0.80286
0.89200
0.94390
0.96217
0.97147
0.97711
0.98848
0.99422
0.99615
0.99711
0.99769

SP
0.98296
0.94123
0.84861
0.77932
0.72884
0.69046
0.60530
0.64032
0.70729
0.75918
0.79711
0.88880
0.94220
0.96102
0.97060
0.97640
0.98813
0.99404
0.99603
0.99702
0.99761

K = 6.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

P
0.98157
0.94216
0.86655
0.81125
0.77217
0.74588
0.72229
0.79274
0.84535
0.87822
0.89999
0.94771
0.97337
0.98215
0.98658
0.98925
0.99461
0.99730
0.99820
0.99865
0.99892

PS
0.98725
0.95667
0.88588
0.82776
0.78554
0.75697
0.72809
0.79600
0.84767
0.88004
0.90148
0.94849
0.97378
0.98242
0.98679
0.98941
0.99469
0.99734
0.99823
0.99867
0.99894

SP
0.97589
0.92765
0.84721
0.79474
0.75890
0.73489
0.71549
0.78948
0.84303
0.87641
0.89850
0.94692
0.97297
0.98188
0.98638
0.98909
0.99453
0.99726
0.99817
0.99863
0.99890

K = 8.0

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
0.97704
0.93544
0.86781
0.82377
0.79739

PS
0.98374
0.94917
0.88174
0.83455
0.80585

SP
0.97074
0.92171
0.85399
0.81299
0.78894

0.10000	0.78400	0.79090	0.77710 -21-
0.20000	0.80001	0.80372	0.79631
0.40000	0.86884	0.87088	0.86681
0.60000	0.90624	0.90766	0.90482
0.80000	0.92759	0.92869	0.92650
1.00000	0.94117	0.94206	0.94028
2.00000	0.96981	0.97026	0.96935
4.00000	0.98475	0.98498	0.98451
6.00000	0.98980	0.98995	0.98964
8.00000	0.99234	0.99246	0.99222
10.00000	0.99387	0.99396	0.99377
20.00000	0.99693	0.99697	0.99688
40.00000	0.99846	0.99849	0.99844
60.00000	0.99897	0.99899	0.99896
80.00000	0.99923	0.99924	0.99922
100.00000	0.99938	0.99939	0.99938

PHI=20.

-22-

K= 0.0

N	P	PS	PD
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	0.21648	0.40751	0.02544
0.60000	0.06593	0.09723	0.03463
0.80000	0.01270	0.01695	0.00846
1.00000	0.00000	0.00000	0.00000
2.00000	0.11144	0.12547	0.09742
4.00000	0.35996	0.38242	0.33749
6.00000	0.50997	0.53115	0.48878
8.00000	0.60464	0.62347	0.58581
10.00000	0.66911	0.68577	0.65244
20.00000	0.81834	0.82853	0.80815
40.00000	0.90466	0.91029	0.89903
60.00000	0.93539	0.93927	0.93151
80.00000	0.95114	0.95410	0.94818
100.00000	0.96072	0.96311	0.95833

K= 0.1

N	P	PS	PD
0.01000	0.99999	1.00000	0.99978
0.02000	0.99956	1.00000	0.99912
0.04000	0.99736	0.99828	0.99644
0.06000	0.99393	0.99509	0.99187
0.08000	0.98900	0.99275	0.98524
0.10000	0.98237	0.98847	0.97627
0.20000	0.91046	0.94536	0.87557
0.40000	0.21936	0.39368	0.04505
0.60000	0.06733	0.09857	0.03610
0.80000	0.01470	0.01954	0.00986
1.00000	0.00254	0.00319	0.00189
2.00000	0.11538	0.12975	0.10101
4.00000	0.36402	0.38651	0.34153
6.00000	0.51354	0.53466	0.49241
8.00000	0.60773	0.62647	0.58899
10.00000	0.67181	0.68838	0.65525
20.00000	0.81997	0.83008	0.80986
40.00000	0.90556	0.91114	0.89908
60.00000	0.93601	0.93985	0.93216
80.00000	0.95161	0.95454	0.94868
100.00000	0.96110	0.96347	0.95873

K= 0.2

N	P	PS	PD
0.01000	0.99978	1.00000	0.99956
0.02000	0.99879	0.99935	0.99824
0.04000	0.99470	0.99651	0.99290
0.06000	0.98790	0.99198	0.98383
0.08000	0.97816	0.98556	0.97075

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.96518
0.83344
0.22262
0.07149
0.02065
0.01007
0.12699
0.37591
0.52394
0.61674
0.67968
0.82470
0.90816
0.93780
0.95297
0.96220

0.97711
0.89502
0.36853
0.10261
0.02716
0.01256
0.14231
0.39846
0.54486
0.63520
0.69596
0.83457
0.91359
0.94154
0.95583
0.96450

0.95325
0.77187
0.07671
0.04038
0.01415
0.00758
0.11166
0.35337
0.50301
0.59827
0.66341
0.81482
0.90272
0.93405
0.95012
0.95990

K = 0.4

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99956
0.99738
0.98942
0.97605
0.95712
0.93242
0.71683
0.22576
0.08741
0.04368
0.03903
0.17049
0.41934
0.56145
0.64896
0.70772
0.84135
0.91726
0.94405
0.95774
0.96604

RS
1.00000
0.99829
0.99297
0.98405
0.97147
0.95507
0.80955
0.33094
0.11864
0.05549
0.04746
0.18882
0.44185
0.58154
0.66638
0.72291
0.85038
0.92218
0.94743
0.96030
0.96812

RD
0.99912
0.99648
0.98587
0.96904
0.94276
0.90978
0.62410
0.12058
0.05618
0.03188
0.03060
0.15215
0.39682
0.54136
0.63155
0.69253
0.83232
0.91274
0.94067
0.95517
0.96397

K = 0.6

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000

R
0.99902
0.99607
0.98420
0.96451
0.93709
0.90219
0.64085
0.23192
0.11220
0.07951
0.08353
0.23404
0.47967
0.61236
0.69211
0.74492
0.86304

RS
0.99935
0.99741
0.98946
0.97627
0.95781
0.93413
0.74426
0.31472
0.14419
0.09716
0.09855
0.25538
0.50160
0.63103
0.70795
0.75856
0.87094

RD
0.99868
0.99473
0.97894
0.95775
0.91638
0.87026
0.53744
0.14913
0.08022
0.06186
0.06850
0.21270
0.45773
0.59368
0.67628
0.73129
0.85514

40.00000
60.00000
80.00000
100.00000

0.92899
0.95208
0.96384
0.97096

0.93324
0.95498
0.96604
0.97274

0.92474
0.94917
0.96163
0.96919

K = 0.8

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99880
0.99475
0.97906
0.95335
0.91826
0.87481
0.59252
0.24361
0.14433
0.12506
0.13908
0.30818
0.54573
0.66655
0.73732
0.78350
0.84504
0.94075
0.96009
0.96992
0.97586

RS
0.99935
0.99651
0.98599
0.96865
0.94470
0.91451
0.69606
0.31312
0.17729
0.14758
0.15953
0.33140
0.56641
0.68340
0.75130
0.79540
0.89176
0.94432
0.96252
0.97176
0.97734

RP
0.99824
0.99298
0.97213
0.93805
0.89182
0.83510
0.48899
0.17410
0.11138
0.10255
0.11864
0.28496
0.52506
0.64969
0.72373
0.77161
0.87832
0.93718
0.95766
0.96808
0.97438

K = 1.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99834
0.99343
0.97401
0.94262
0.90073
0.85038
0.56215
0.26042
0.18213
0.17713
0.20114
0.38471
0.60948
0.71735
0.77903
0.81875
0.90472
0.95115
0.96716
0.97526
0.98016

RS
0.99888
0.99561
0.98257
0.96123
0.93220
0.89635
0.66116
0.32130
0.21582
0.20304
0.22522
0.40843
0.62841
0.73221
0.79115
0.82894
0.91035
0.95411
0.96916
0.97678
0.98138

RP
0.99780
0.99125
0.96545
0.92402
0.86927
0.80441
0.46314
0.19954
0.14845
0.15122
0.17705
0.36099
0.59056
0.70248
0.76692
0.80856
0.89909
0.94819
0.96515
0.97375
0.97894

K = 1.5

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
0.99756
0.99021
0.96187
0.91800
0.86303

RS
0.99841
0.99347
0.97425
0.94374
0.90402

RP
0.99671
0.98695
0.94948
0.89227
0.82205

0.10000	0.80196	0.85768	0.74625
0.20000	0.52998	0.61293	0.44703
0.40000	0.31869	0.36695	0.27042
0.60000	0.29051	0.32396	0.25706
0.80000	0.31749	0.34618	0.28879
1.00000	0.36065	0.38728	0.33402
2.00000	0.55540	0.57648	0.53432
4.00000	0.73742	0.75151	0.72333
6.00000	0.81513	0.82553	0.80474
8.00000	0.85756	0.86577	0.84936
10.00000	0.88421	0.89098	0.87744
20.00000	0.94024	0.94384	0.93664
40.00000	0.96965	0.97150	0.96779
60.00000	0.97966	0.98091	0.97841
80.00000	0.98470	0.98565	0.98376
100.00000	0.98774	0.98850	0.98699

K= 2.0

N	P	RS	RD
0.01000	0.99674	0.99785	0.99562
0.02000	0.98702	0.99129	0.98275
0.04000	0.95051	0.96630	0.93473
0.06000	0.89680	0.92797	0.86564
0.08000	0.83398	0.88052	0.78743
0.10000	0.76940	0.82841	0.71038
0.20000	0.52959	0.59803	0.46116
0.40000	0.38933	0.42992	0.34874
0.60000	0.40150	0.43227	0.37073
0.80000	0.44886	0.47557	0.42215
1.00000	0.50019	0.52439	0.47599
2.00000	0.67975	0.69655	0.66294
4.00000	0.81998	0.83017	0.80979
6.00000	0.87545	0.88271	0.86820
8.00000	0.90489	0.91052	0.89926
10.00000	0.92309	0.92769	0.91850
20.00000	0.96073	0.96312	0.95834
40.00000	0.98016	0.98138	0.97894
60.00000	0.98673	0.98755	0.98591
80.00000	0.99003	0.99065	0.98941
100.00000	0.99202	0.99251	0.99152

K= 3.0

N	P	RS	RD
0.01000	0.99512	0.99676	0.99347
0.02000	0.98089	0.98712	0.97466
0.04000	0.93061	0.95179	0.90942
0.06000	0.86484	0.90213	0.82754
0.08000	0.79786	0.84701	0.74871
0.10000	0.73770	0.79314	0.69225
0.20000	0.56649	0.61463	0.51835
0.40000	0.53093	0.56077	0.50110
0.60000	0.58650	0.60974	0.56326
0.80000	0.64440	0.66394	0.62486
1.00000	0.69213	0.70908	0.67519
2.00000	0.82199	0.83218	0.81180
4.00000	0.90517	0.91280	0.89954
6.00000	0.93554	0.93943	0.93166
8.00000	0.95121	0.95417	0.94825
10.00000	0.96075	0.96314	0.95836
20.00000	0.98017	0.98139	0.97895

40.00000
60.00000
80.00000
100.00000

0.99003
0.99334
0.99530
0.99600

0.99065
0.99376
0.99531
0.99625

0.98941
0.99293
0.99469
0.99575

-26-

K= 4.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

P
0.99351
0.97511
0.91473
0.84505
0.78252
0.73210
0.62004
0.64645
0.71147
0.76242
0.79979
0.89024
0.94296
0.96153
0.97099
0.97671
0.98828
0.99412
0.99608
0.99706
0.99764

PS
0.99566
0.98310
0.93942
0.88370
0.82827
0.77954
0.65563
0.66865
0.72834
0.77616
0.81138
0.89674
0.94641
0.96388
0.97276
0.97814
0.98901
0.99449
0.99632
0.99724
0.99779

PD
0.99136
0.96711
0.89004
0.80639
0.73676
0.68466
0.58444
0.62425
0.69459
0.74869
0.78819
0.88374
0.93951
0.95918
0.96921
0.97528
0.98756
0.99376
0.99584
0.99688
0.99750

K= 6.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99042
0.96486
0.89420
0.83021
0.78382
0.75305
0.72325
0.79266
0.84519
0.87807
0.89985
0.94762
0.97333
0.98212
0.98656
0.98923
0.99460
0.99730
0.99820
0.99865
0.99892

PS
0.99355
0.97572
0.92128
0.86461
0.81876
0.78587
0.74483
0.80559
0.85454
0.88540
0.90587
0.95081
0.97497
0.98322
0.98739
0.98990
0.99493
0.99746
0.99831
0.99873
0.99898

PD
0.98728
0.95399
0.86713
0.79582
0.74888
0.72024
0.70168
0.77973
0.83584
0.87074
0.89382
0.94444
0.97169
0.98102
0.98573
0.98856
0.99426
0.99713
0.99808
0.99856
0.99885

K= 8.0

N
0.01000
0.02000
0.04000
0.06000
0.08000

P
0.98749
0.95657
0.88509
0.83310
0.80236

PS
0.99153
0.96938
0.91080
0.86099
0.82822

PD
0.98345
0.94377
0.85939
0.80522
0.77649

0.10000	0.78677	0.80990	0.76364
0.20000	0.80021	0.81450	0.78593
0.40000	0.86871	0.87688	0.86054
0.60000	0.90611	0.91185	0.90037
0.80000	0.92748	0.93191	0.92306
1.00000	0.94108	0.94467	0.93748
2.00000	0.96976	0.97161	0.96790
4.00000	0.98472	0.98566	0.98378
6.00000	0.98978	0.99041	0.98915
8.00000	0.99232	0.99280	0.99185
10.00000	0.99385	0.99424	0.99347
20.00000	0.99692	0.99711	0.99673
40.00000	0.99846	0.99856	0.99836
60.00000	0.99897	0.99904	0.99891
80.00000	0.99923	0.99928	0.99918
100.00000	0.99938	0.99942	0.99935

PHI=30.

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K= 0.0

N	R	RS	RP
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	0.10001	0.19906	0.30096
1.00000	0.01490	0.02626	0.00355
2.00000	0.00000	0.00000	0.00000
4.00000	0.11295	0.14590	0.08001
6.00000	0.35977	0.41183	0.30771
8.00000	0.50893	0.55796	0.45990
10.00000	0.60332	0.64689	0.55975
20.00000	0.66773	0.70630	0.62916
40.00000	0.81723	0.84083	0.79364
60.00000	0.90397	0.91702	0.89093
80.00000	0.93490	0.94389	0.92590
100.00000	0.95076	0.95762	0.94390
	0.96041	0.96595	0.95486

K= 0.1

N	R	RS	RP
0.01000	0.99993	1.00000	0.99986
0.02000	0.99972	1.00000	0.99945
0.04000	0.99837	0.99896	0.99777
0.06000	0.99620	0.99746	0.99495
0.08000	0.99322	0.99551	0.99094
0.10000	0.98928	0.99289	0.98568
0.20000	0.95273	0.96905	0.93641
0.40000	0.69203	0.80744	0.57662
0.60000	0.10007	0.19355	0.00659
0.80000	0.01720	0.02998	0.00442
1.00000	0.00277	0.00440	0.00114
2.00000	0.11691	0.15062	0.08320
4.00000	0.36381	0.41592	0.31170
6.00000	0.51249	0.56136	0.46361
8.00000	0.60642	0.64977	0.56306
10.00000	0.67044	0.70878	0.63210
20.00000	0.81887	0.84228	0.79547
40.00000	0.90488	0.91781	0.89195
60.00000	0.93552	0.94443	0.92661
80.00000	0.95123	0.95803	0.94444
100.00000	0.96079	0.96628	0.95530

K= 0.2

N	R	RS	RP
0.01000	0.99986	1.00000	0.99972
0.02000	0.99915	0.99940	0.99889
0.04000	0.99665	0.99776	0.99555
0.06000	0.99246	0.99499	0.98993
0.08000	0.98650	0.99101	0.98198

0.10000	0.97872	0.98584	0.97160
0.20000	0.90849	0.93933	0.87764
0.40000	0.52249	0.67141	0.37357
0.60000	0.10139	0.18511	0.01767
0.80000	0.02395	0.04059	0.00731
1.00000	0.01093	0.01706	0.00480
2.00000	0.12856	0.16441	0.09270
4.00000	0.37564	0.42785	0.32344
6.00000	0.52286	0.57127	0.47445
8.00000	0.61541	0.65813	0.57269
10.00000	0.67831	0.71598	0.64065
20.00000	0.82362	0.84648	0.80075
40.00000	0.90749	0.92009	0.89490
60.00000	0.93732	0.94599	0.92865
80.00000	0.95261	0.95922	0.94600
100.00000	0.96190	0.96724	0.95656

K = 0.4

N	R	RS	RP
0.01000	0.99972	1.00000	0.99945
0.02000	0.99837	0.99896	0.99778
0.04000	0.99335	0.99557	0.99112
0.06000	0.98499	0.98998	0.98001
0.08000	0.97327	0.98213	0.96440
0.10000	0.95813	0.97198	0.94428
0.20000	0.83002	0.88443	0.77560
0.40000	0.37595	0.51903	0.23286
0.60000	0.11199	0.18341	0.04057
0.80000	0.04920	0.07721	0.02118
1.00000	0.04175	0.06166	0.02184
2.00000	0.17210	0.21463	0.12957
4.00000	0.41885	0.47088	0.36681
6.00000	0.56027	0.60672	0.51383
8.00000	0.64761	0.68789	0.60734
10.00000	0.70637	0.74151	0.67122
20.00000	0.84034	0.86125	0.81943
40.00000	0.91665	0.92806	0.90524
60.00000	0.94362	0.95145	0.93579
80.00000	0.95740	0.96336	0.95145
100.00000	0.96577	0.97058	0.96096

K = 0.6

N	R	RS	RP
0.01000	0.99958	1.00000	0.99917
0.02000	0.99749	0.99831	0.99668
0.04000	0.99004	0.99336	0.98673
0.06000	0.97765	0.98504	0.97025
0.08000	0.96040	0.97343	0.94736
0.10000	0.93840	0.95852	0.91828
0.20000	0.76524	0.83640	0.69408
0.40000	0.32451	0.44967	0.19935
0.60000	0.13313	0.20083	0.06542
0.80000	0.08677	0.12643	0.04711
1.00000	0.08782	0.12207	0.05356
2.00000	0.23546	0.28456	0.18636
4.00000	0.47890	0.52951	0.42829
6.00000	0.61108	0.65424	0.56702
8.00000	0.69077	0.72738	0.65415
10.00000	0.74363	0.77517	0.71208
20.00000	0.86213	0.88042	0.84383

40.00000
60.00000
80.00000
100.00000

0.92845
0.95170
0.96355
0.97073

0.93831
0.95844
0.96866
0.97485

0.91860
0.94497
0.95844
0.96661

-30-

K = 0.9

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99915
0.99667
0.98677
0.97043
0.94793
0.91965
0.71342
0.30791
0.16245
0.13298
0.14402
0.30916
0.54472
0.66522
0.73602
0.78230
0.84424
0.94029
0.95978
0.96968
0.97566

RS
0.99943
0.99777
0.99116
0.98017
0.96492
0.94555
0.79560
0.41928
0.23000
0.18211
0.18965
0.36228
0.59238
0.70415
0.76336
0.80981
0.89980
0.94857
0.96541
0.97394
0.97910

RD
0.99889
0.99557
0.98238
0.96069
0.93093
0.89376
0.63124
0.19654
0.09401
0.08385
0.09840
0.25604
0.49706
0.62629
0.70368
0.75478
0.86868
0.93202
0.95415
0.96541
0.97223

K = 1.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99901
0.99587
0.98353
0.96336
0.93593
0.90199
0.67305
0.30830
0.19778
0.18476
0.20588
0.38514
0.60830
0.71604
0.77782
0.81756
0.90403
0.95077
0.96689
0.97506
0.98000

RS
0.99940
0.99726
0.98899
0.97537
0.95665
0.93314
0.76184
0.40991
0.26612
0.24057
0.25910
0.43928
0.65191
0.75039
0.80594
0.84124
0.91708
0.95763
0.97155
0.97858
0.98293

RD
0.99852
0.99447
0.97807
0.95135
0.91520
0.87085
0.58426
0.20670
0.12943
0.12894
0.15267
0.33100
0.56469
0.68169
0.74080
0.79408
0.89099
0.94391
0.96224
0.97155
0.97717

K = 1.5

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
0.99854
0.99382
0.97559
0.94648
0.90823

RS
0.99916
0.99591
0.98363
0.96378
0.93719

RD
0.99792
0.99174
0.96755
0.92917
0.87927

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.86301
0.61101
0.34526
0.30063
0.32252
0.36336
0.55474
0.73618
0.81404
0.85664
0.88341
0.93978
0.96940
0.97949
0.98458
0.98764

0.90491
0.70430
0.43197
0.36925
0.38436
0.42213
0.60287
0.76868
0.83808
0.87563
0.89909
0.94813
0.97371
0.98239
0.98677
0.98940

0.82110
0.51771
0.25855
0.23201
0.26068
0.30460
0.50660
0.70367
0.79000
0.83764
0.86773
0.93144
0.96510
0.97659
0.98239
0.98589

K= 2.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99810
0.99182
0.96791
0.93088
0.88414
0.83164
0.58649
0.40526
0.40734
0.45128
0.50103
0.67868
0.81992
0.87462
0.90421
0.92252
0.96042
0.98000
0.98662
0.98995
0.99195

RS
0.99897
0.99461
0.97839
0.95287
0.91970
0.88108
0.67606
0.48228
0.47194
0.50962
0.55492
0.71717
0.84246
0.89142
0.91725
0.93317
0.96597
0.98283
0.98852
0.99138
0.99310

RP
0.99724
0.98903
0.95744
0.90889
0.84858
0.78220
0.49693
0.32824
0.34274
0.30295
0.44714
0.64019
0.79539
0.85782
0.89117
0.91188
0.95488
0.97717
0.98472
0.98852
0.99080

K= 3.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000

R
0.99694
0.98779
0.95361
0.90413
0.84731
0.79007
0.59465
0.53673
0.58779
0.64426
0.69144
0.82100
0.90450
0.93506
0.95083
0.96044
0.98000

RS
0.99802
0.99186
0.96849
0.93353
0.89145
0.84673
0.67080
0.59768
0.63844
0.68792
0.72978
0.84446
0.91752
0.94405
0.95769
0.96598
0.98283

RP
0.99586
0.98372
0.93872
0.87473
0.80317
0.73342
0.51850
0.47578
0.53714
0.60059
0.65310
0.79754
0.89148
0.92607
0.94397
0.95490
0.97718

40.00000
60.00000
80.00000
100.00000

0.98995
0.99329
0.99496
0.99597

0.99138
0.99424
0.99568
0.99654

0.98852
0.99233
0.99424
0.99539

-32-

K = 4.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99599
0.98390
0.94094
0.88365
0.82434
0.77090
0.63441
0.64830
0.71123
0.76166
0.79889
0.88951
0.94253
0.96123
0.97075
0.97653
0.98819
0.99407
0.99605
0.99703
0.99763

RS
0.99747
0.98923
0.95951
0.91789
0.87203
0.82792
0.69744
0.69563
0.74882
0.79276
0.82535
0.90452
0.95052
0.96666
0.97487
0.97984
0.98986
0.99492
0.99661
0.99746
0.99796

RP
0.99450
0.97858
0.92236
0.84940
0.77664
0.71388
0.57138
0.60096
0.67365
0.73057
0.77243
0.87450
0.93454
0.95579
0.96664
0.97321
0.98651
0.99323
0.99548
0.99661
0.99729

K = 6.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99392
0.97660
0.92105
0.85977
0.80875
0.77203
0.72719
0.79235
0.84448
0.87736
0.89920
0.94722
0.97311
0.98198
0.98645
0.98914
0.99455
0.99727
0.99818
0.99864
0.99891

RS
0.99601
0.98419
0.94471
0.89757
0.85482
0.82144
0.77028
0.82108
0.86573
0.89415
0.91306
0.95459
0.97691
0.98453
0.98837
0.99068
0.99533
0.99766
0.99844
0.99883
0.99906

RP
0.99183
0.96901
0.89739
0.82197
0.76268
0.72261
0.68409
0.76363
0.82323
0.86056
0.88534
0.93986
0.96932
0.97942
0.98452
0.98760
0.99378
0.99688
0.99792
0.99844
0.99875

K = 8.0

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
0.99195
0.97008
0.90829
0.85289
0.81614

RS
0.99467
0.97960
0.93433
0.88926
0.85612

RP
0.98924
0.96055
0.88226
0.81651
0.77617

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.79586
0.80117
0.86815
0.90554
0.92698
0.94065
0.96952
0.98459
0.98970
0.99226
0.99380
0.99690
0.99845
0.99896
0.99922
0.99938

0.83577
0.83136
0.88662
0.91869
0.93717
0.94895
0.97381
0.98678
0.99116
0.99336
0.99469
0.99734
0.99867
0.99911
0.99933
0.99947

0.75595
0.77098
0.84968
0.89239
0.91680
0.93235
0.96522
0.98241
0.98823
0.99116
0.99292
0.99645
0.99822
0.99882
0.99911
0.99929

PHI=40.

-34-

K= 0.0

N	R	RS	RD
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	0.02731	0.05441	0.00021
1.00000	0.00000	0.00000	0.00000
2.00000	0.11775	0.17979	0.05571
4.00000	0.35926	0.45562	0.26290
6.00000	0.50587	0.59660	0.41514
8.00000	0.59942	0.68014	0.51870
10.00000	0.66364	0.73517	0.59211
20.00000	0.81393	0.85782	0.77004
40.00000	0.90192	0.92624	0.87759
60.00000	0.93343	0.95021	0.91664
80.00000	0.94962	0.96242	0.93681
100.00000	0.95947	0.96982	0.94912

K= 0.1

N	R	RS	RD
0.01000	0.99995	1.00000	0.99990
0.02000	0.99981	1.00000	0.99962
0.04000	0.99947	0.99947	0.99847
0.06000	0.99748	0.99341	0.99655
0.08000	0.99541	0.99699	0.99382
0.10000	0.99273	0.99517	0.99028
0.20000	0.96905	0.97935	0.95875
0.40000	0.83905	0.89134	0.78677
0.60000	0.39374	0.54042	0.24706
0.80000	0.03040	0.05969	0.00111
1.00000	0.00369	0.00709	0.00029
2.00000	0.12175	0.18513	0.05837
4.00000	0.36324	0.45966	0.26682
6.00000	0.50939	0.59984	0.41895
8.00000	0.60250	0.68282	0.52218
10.00000	0.66635	0.73745	0.59525
20.00000	0.81558	0.85913	0.77204
40.00000	0.90284	0.92694	0.87873
60.00000	0.93406	0.95069	0.91743
80.00000	0.95010	0.96278	0.93742
100.00000	0.95986	0.97012	0.94961

K= 0.2

N	R	RS	RD
0.01000	0.99990	1.00000	0.99981
0.02000	0.99962	1.00000	0.99924
0.04000	0.99782	0.99870	0.99694
0.06000	0.99485	0.99661	0.99310
0.08000	0.99079	0.99388	0.98769

0.10000	0.98550	0.99033	0.98067
0.20000	0.93936	0.95924	0.91948
0.40000	0.71296	0.79885	0.62707
0.60000	0.25751	0.38954	0.12547
0.80000	0.03911	0.07423	0.00399
1.00000	0.01423	0.02664	0.00183
2.00000	0.13350	0.20063	0.06637
4.00000	0.37489	0.47141	0.27837
6.00000	0.51967	0.60922	0.43011
8.00000	0.61147	0.69061	0.53233
10.00000	0.67423	0.74408	0.60437
20.00000	0.82038	0.86292	0.77785
40.00000	0.90550	0.92898	0.88202
60.00000	0.93590	0.95208	0.91972
80.00000	0.95150	0.96384	0.93917
100.00000	0.96100	0.97097	0.95103

K = 0.4

N	R	RS	RD
0.01000	0.99981	1.00000	0.99962
0.02000	0.99897	0.99947	0.99847
0.04000	0.99543	0.99696	0.99390
0.06000	0.98971	0.99315	0.98627
0.08000	0.98166	0.98774	0.97558
0.10000	0.97130	0.98077	0.96193
0.20000	0.88425	0.92109	0.84741
0.40000	0.54618	0.66279	0.42958
0.60000	0.19178	0.30031	0.08326
0.80000	0.06871	0.12043	0.01699
1.00000	0.05091	0.08836	0.01347
2.00000	0.17707	0.25568	0.09846
4.00000	0.41745	0.51345	0.32145
6.00000	0.55678	0.64266	0.47090
8.00000	0.64360	0.71821	0.56899
10.00000	0.70234	0.76754	0.63714
20.00000	0.83731	0.87623	0.79840
40.00000	0.91482	0.93609	0.89356
60.00000	0.94232	0.95693	0.92772
80.00000	0.95640	0.96752	0.94529
100.00000	0.96496	0.97393	0.95598

K = 0.5

N	R	RS	RD
0.01000	0.99971	1.00000	0.99943
0.02000	0.99840	0.99908	0.99771
0.04000	0.99316	0.99546	0.99087
0.06000	0.98461	0.98972	0.97950
0.08000	0.97271	0.98171	0.96370
0.10000	0.95749	0.97142	0.94357
0.20000	0.83535	0.88623	0.78447
0.40000	0.45631	0.58016	0.33245
0.60000	0.18944	0.29117	0.08770
0.80000	0.10865	0.17708	0.04022
1.00000	0.10087	0.16210	0.03964
2.00000	0.23978	0.32946	0.15009
4.00000	0.47668	0.56998	0.38348
6.00000	0.60731	0.68709	0.52752
8.00000	0.68676	0.75462	0.61891
10.00000	0.73976	0.79830	0.68121
20.00000	0.85940	0.89346	0.82534

40.00000
60.00000
80.00000
100.00000

0.92685
0.95058
0.96268
0.97003

0.94523
0.96315
0.97223
0.97772

0.90848
0.93801
0.95314
0.96233

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K = 0.8

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99962
0.99778
0.99090
0.97958
0.96394
0.94414
0.79290
0.41063
0.20749
0.15497
0.15821
0.31215
0.54177
0.66131
0.73216
0.77870
0.88186
0.93893
0.95883
0.96895
0.97508

RS
1.00000
0.99860
0.99394
0.98633
0.97578
0.96231
0.85509
0.53408
0.30906
0.23720
0.23758
0.40849
0.62947
0.73331
0.79212
0.82979
0.91084
0.95437
0.96934
0.97692
0.98149

RP
0.99924
0.99695
0.98785
0.97293
0.95211
0.92598
0.73072
0.28718
0.10592
0.07274
0.07885
0.21582
0.45406
0.58932
0.67219
0.72761
0.85287
0.92349
0.94832
0.96098
0.96866

K = 1.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99952
0.99718
0.98864
0.97463
0.95539
0.93130
0.75681
0.39055
0.23550
0.20521
0.21920
0.38653
0.60485
0.71218
0.77421
0.81440
0.90198
0.94962
0.96611
0.97446
0.97951

RS
1.00000
0.99817
0.99242
0.98300
0.96997
0.95348
0.82786
0.51169
0.33896
0.29757
0.31067
0.48443
0.68515
0.77576
0.82621
0.85822
0.92620
0.96243
0.97479
0.98103
0.98480

RP
0.99905
0.99619
0.98486
0.96626
0.94082
0.90912
0.68576
0.26942
0.13203
0.11285
0.12773
0.28864
0.52456
0.64860
0.72222
0.77058
0.87767
0.93682
0.95742
0.96789
0.97423

K = 1.5

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
0.99902
0.99575
0.98309
0.96260
0.93512

RS
0.99947
0.99721
0.98869
0.97484
0.95606

RP
0.99857
0.99430
0.97749
0.95036
0.91418

0.10000	0.90173	0.93287	0.87058
0.20000	0.69177	0.77658	0.60696
0.40000	0.39683	0.51197	0.28169
0.60000	0.32534	0.43221	0.21847
0.80000	0.33605	0.43896	0.23314
1.00000	0.37110	0.47222	0.26998
2.00000	0.55296	0.64024	0.46569
4.00000	0.73253	0.70256	0.67251
6.00000	0.81080	0.85540	0.76620
8.00000	0.85387	0.88918	0.81856
10.00000	0.88103	0.91021	0.85185
20.00000	0.93841	0.95398	0.92285
40.00000	0.96867	0.97671	0.96063
60.00000	0.97899	0.98441	0.97358
80.00000	0.98420	0.98928	0.98012
100.00000	0.98734	0.99062	0.98406

K= 2.0

N	R	RS	RP
0.01000	0.99878	0.99947	0.99810
0.02000	0.99435	0.99627	0.99242
0.04000	0.97766	0.98503	0.97029
0.06000	0.95118	0.96705	0.93532
0.08000	0.91663	0.94321	0.89006
0.10000	0.87613	0.91468	0.83758
0.20000	0.65594	0.74642	0.56547
0.40000	0.43932	0.54866	0.32998
0.60000	0.42244	0.52670	0.31858
0.80000	0.45820	0.55717	0.35922
1.00000	0.50370	0.50775	0.40965
2.00000	0.67565	0.74589	0.60541
4.00000	0.81580	0.85940	0.77221
6.00000	0.87213	0.90336	0.84090
8.00000	0.90218	0.92645	0.87791
10.00000	0.92082	0.94066	0.90099
20.00000	0.95949	0.96984	0.94914
40.00000	0.97951	0.98480	0.97423
60.00000	0.98629	0.98984	0.98275
80.00000	0.98970	0.99237	0.98703
100.00000	0.99175	0.99389	0.98961

K= 3.0

N	R	RS	RP
0.01000	0.99788	0.99860	0.99715
0.02000	0.99154	0.99436	0.98871
0.04000	0.96730	0.97800	0.95659
0.06000	0.93057	0.95280	0.90834
0.08000	0.88575	0.92129	0.85021
0.10000	0.83739	0.88628	0.78349
0.20000	0.64010	0.73002	0.55018
0.40000	0.55125	0.64582	0.45667
0.60000	0.59171	0.67743	0.50599
0.80000	0.64418	0.72086	0.56751
1.00000	0.68967	0.75828	0.62105
2.00000	0.81810	0.86133	0.77488
4.00000	0.90250	0.92672	0.87829
6.00000	0.93361	0.95035	0.91686
8.00000	0.94969	0.96248	0.93690
10.00000	0.95951	0.96985	0.94917
20.00000	0.97952	0.98480	0.97424

40.00000
60.00000
80.00000
100.00000

0.98970
0.99312
0.99484
0.99587

0.99237
0.99491
0.99618
0.99694

0.98703
0.99134
0.99349
0.99479

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K = 4.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99719
0.98880
0.95773
0.91331
0.86325
0.81401
0.66244
0.65365
0.71090
0.75966
0.79640
0.88735
0.94123
0.96032
0.97006
0.97596
0.98790
0.99393
0.99595
0.99696
0.99757

RS
0.99817
0.99252
0.97147
0.94065
0.90482
0.86831
0.74537
0.73132
0.77659
0.81544
0.84447
0.91515
0.95611
0.97046
0.97774
0.98215
0.99103
0.99550
0.99700
0.99775
0.99820

RD
0.99671
0.99508
0.94400
0.88598
0.82168
0.75970
0.57952
0.57598
0.64521
0.70389
0.74832
0.85955
0.92635
0.95017
0.96237
0.96977
0.98476
0.99235
0.99489
0.99617
0.99693

K = 6.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99575
0.98354
0.94145
0.88931
0.84033
0.80108
0.73703
0.79181
0.84255
0.87533
0.89731
0.94604
0.97247
0.98154
0.98611
0.98887
0.99442
0.99720
0.99814
0.99860
0.99888

RS
0.99717
0.98897
0.96017
0.92320
0.88701
0.85672
0.80188
0.84183
0.88091
0.90607
0.92286
0.95975
0.97955
0.98630
0.98971
0.99176
0.99587
0.99793
0.99862
0.99897
0.99917

RD
0.99474
0.97811
0.92274
0.85541
0.79366
0.74544
0.67218
0.74178
0.80420
0.84459
0.87177
0.93233
0.96539
0.97677
0.98252
0.98599
0.99297
0.99648
0.99765
0.99824
0.99859

K = 8.0

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
0.99440
0.97867
0.92934
0.87773
0.83826

RS
0.99629
0.98567
0.95155
0.91421
0.88418

RD
0.99251
0.97167
0.90712
0.84125
0.79234

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.81328
0.80413
0.86667
0.90389
0.92553
0.93938
0.96880
0.98422
0.98944
0.99207
0.99365
0.99682
0.99841
0.99894
0.99920
0.99936

0.86417
0.85306
0.89974
0.92796
0.94432
0.95476
0.97681
0.98930
0.99218
0.99413
0.99530
0.99765
0.99882
0.99921
0.99941
0.99953

0.76239
0.75520
0.83361
0.87982
0.90673
0.92400
0.96079
0.98014
0.98671
0.99031
0.99200
0.99599
0.99799
0.99866
0.99900
0.99920

PHI=50.

-40-

K= 0.0

N	R	RS	RP
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	0.15101	0.22273	0.07930
2.00000	0.00000	0.00000	0.00000
4.00000	0.13042	0.23402	0.02682
6.00000	0.35831	0.51641	0.20022
8.00000	0.49861	0.64807	0.34914
10.00000	0.59002	0.72355	0.45649
20.00000	0.65370	0.77242	0.53499
40.00000	0.80578	0.87924	0.73232
60.00000	0.89681	0.93773	0.85588
80.00000	0.92976	0.95805	0.90147
100.00000	0.94676	0.96837	0.92516
	0.95714	0.97462	0.93966

K= 0.1

N	R	RS	RP
0.01000	0.99997	1.00000	0.99993
0.02000	0.99987	1.00000	0.99973
0.04000	0.99924	0.99956	0.99892
0.06000	0.99824	0.99891	0.99757
0.08000	0.99676	0.99786	0.99567
0.10000	0.99489	0.99659	0.99320
0.20000	0.97864	0.98564	0.97163
0.40000	0.89650	0.92816	0.86484
0.60000	0.66246	0.74587	0.57905
0.80000	0.10898	0.17106	0.04690
1.00000	0.00717	0.01383	0.00051
2.00000	0.13450	0.24012	0.02889
4.00000	0.36215	0.52029	0.20401
6.00000	0.50205	0.65103	0.35307
8.00000	0.59307	0.72595	0.46020
10.00000	0.65642	0.77444	0.53840
20.00000	0.83748	0.88037	0.73459
40.00000	0.89776	0.93833	0.85720
60.00000	0.93043	0.95845	0.90240
80.00000	0.94727	0.96868	0.92587
100.00000	0.95755	0.97486	0.94024

K= 0.2

N	R	RS	RP
0.01000	0.99993	1.00000	0.99987
0.02000	0.99973	1.00000	0.99946
0.04000	0.99843	0.99901	0.99785
0.06000	0.99638	0.99760	0.99515
0.08000	0.99353	0.99570	0.99135

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.98983
0.95787
0.80731
0.47613
0.09824
0.02537
0.14640
0.37337
0.51210
0.60196
0.66431
0.81241
0.90054
0.93235
0.94875
0.95875

0.99321
0.97154
0.86352
0.58606
0.16031
0.04814
0.25759
0.53154
0.65961
0.73291
0.78028
0.88363
0.94005
0.95963
0.96957
0.97558

0.98644
0.94420
0.75109
0.36621
0.03616
0.00261
0.03522
0.21519
0.36458
0.47102
0.54834
0.74120
0.86103
0.90508
0.92793
0.94192

K= 0.4

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99987
0.99946
0.99679
0.99274
0.98709
0.97980
0.91845
0.67034
0.32567
0.12021
0.07595
0.18975
0.41439
0.54849
0.63391
0.69255
0.82984
0.91028
0.93910
0.95391
0.96292

RS
1.00000
1.00000
0.99787
0.99516
0.99137
0.98646
0.94444
0.75881
0.44347
0.19875
0.13723
0.31772
0.57137
0.68997
0.75746
0.80090
0.89505
0.94609
0.96373
0.97267
0.97808

RP
0.99973
0.99893
0.99570
0.99033
0.98281
0.97313
0.89246
0.58187
0.20787
0.04168
0.01468
0.06179
0.25740
0.40700
0.51036
0.58420
0.76463
0.87448
0.91447
0.93514
0.94777

K= 0.6

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000

R
0.99980
0.99881
0.99518
0.98915
0.98074
0.96997
0.88222
0.58005
0.28699
0.15824
0.13240
0.25067
0.47166
0.59830
0.67707
0.73033
0.85266

RS
1.00000
0.99923
0.99680
0.99276
0.98711
0.97983
0.91913
0.68591
0.40697
0.25672
0.22650
0.39448
0.62389
0.72987
0.78959
0.82777
0.90981

RP
0.99960
0.99839
0.99357
0.98555
0.97438
0.96010
0.84530
0.47419
0.16700
0.05977
0.03831
0.10687
0.31943
0.46673
0.56455
0.63289
0.79551

40.00000
60.00000
80.00000
100.00000

0.92287
0.94778
0.96053
0.96827

0.95384
0.96898
0.97665
0.98127

0.89191
0.92657
0.94441
0.95527

-42-

K= 0.8

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99973
0.99843
0.99358
0.98559
0.97449
0.96038
0.84947
0.52411
0.28660
0.20173
0.19053
0.31986
0.53497
0.65195
0.72278
0.76990
0.87594
0.93554
0.95646
0.96714
0.97361

RS
1.00000
0.99901
0.99573
0.99036
0.98290
0.97334
0.89595
0.63942
0.41100
0.31760
0.30889
0.47301
0.67832
0.77090
0.82241
0.85509
0.92463
0.96157
0.97421
0.98059
0.98444

RP
0.99946
0.99785
0.99144
0.98081
0.96609
0.94741
0.80300
0.40880
0.16220
0.08587
0.07216
0.16670
0.39161
0.53300
0.62314
0.68470
0.82726
0.90951
0.93872
0.95368
0.96277

K= 1.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99966
0.99803
0.99199
0.98206
0.96836
0.95105
0.82036
0.49202
0.30279
0.24777
0.24891
0.39051
0.59682
0.70289
0.76543
0.80640
0.89689
0.94677
0.96414
0.97296
0.97830

RS
1.00000
0.99875
0.99467
0.98800
0.97876
0.96701
0.87510
0.61283
0.43252
0.37710
0.38369
0.54576
0.72835
0.80818
0.85201
0.87961
0.93778
0.96838
0.97880
0.98406
0.98723

RP
0.99933
0.99732
0.98932
0.97612
0.95795
0.93510
0.76563
0.37121
0.17306
0.11844
0.11413
0.23526
0.46530
0.59760
0.67885
0.73320
0.85601
0.92517
0.94947
0.96185
0.96937

K= 1.5

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
0.99927
0.99700
0.98805
0.97343
0.95359

RS
0.99956
0.99802
0.99202
0.98220
0.96876

RP
0.99899
0.99598
0.98407
0.96467
0.93842

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.92911
0.76329
0.47231
0.37205
0.36500
0.38902
0.54946
0.72385
0.80290
0.84707
0.87515
0.93500
0.96684
0.97775
0.98326
0.98658

0.95203
0.83371
0.59990
0.51188
0.51082
0.53867
0.68891
0.82293
0.87722
0.90617
0.92411
0.96124
0.98042
0.98690
0.99016
0.99212

0.90618
0.69287
0.34472
0.23221
0.21918
0.23937
0.41001
0.62478
0.72859
0.78797
0.82618
0.90876
0.95327
0.96859
0.97635
0.98103

-43-

K= 2.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99932
0.99602
0.98417
0.96513
0.93980
0.90938
0.72646
0.49522
0.45330
0.47431
0.51091
0.66892
0.80825
0.86600
0.89716
0.91660
0.95716
0.97830
0.98547
0.98908
0.99125

PS
0.99937
0.99738
0.98942
0.97660
0.95939
0.93850
0.80696
0.62478
0.59440
0.61815
0.65295
0.78253
0.88070
0.91828
0.93792
0.94997
0.97463
0.98723
0.99147
0.99359
0.99487

PP
0.99866
0.99465
0.97892
0.95366
0.92022
0.88027
0.64596
0.36565
0.31219
0.33047
0.36887
0.55531
0.73581
0.81373
0.85639
0.88322
0.93970
0.96937
0.97947
0.98456
0.98763

K= 3.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000

R
0.99850
0.99402
0.97668
0.94974
0.91569
0.87737
0.69767
0.57990
0.60168
0.64527
0.68646
0.81127
0.89760
0.93000
0.94697
0.95719
0.97830

PS
0.99901
0.99603
0.98439
0.96620
0.94297
0.91648
0.78751
0.70297
0.72583
0.76220
0.79416
0.88247
0.93816
0.95818
0.96843
0.97464
0.98723

PP
0.99759
0.99202
0.96896
0.93327
0.88842
0.83825
0.60782
0.45683
0.47753
0.52834
0.57876
0.74007
0.85703
0.90183
0.92531
0.93975
0.96937

40.00000
60.00000
80.00000
100.00000

0.98908
0.99270
0.99452
0.99561

0.99359
0.99572
0.99679
0.99743

0.98456
0.98968
0.99225
0.99380

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K= 4.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99804
0.99207
0.96962
0.93625
0.89665
0.85531
0.70462
0.66630
0.71140
0.75579
0.79096
0.88213
0.93802
0.95805
0.96831
0.97454
0.98717
0.99356
0.99570
0.99677
0.99742

RS
0.99875
0.99472
0.97966
0.95710
0.93004
0.90146
0.79542
0.77429
0.81095
0.84368
0.86832
0.92838
0.96305
0.97516
0.98120
0.98500
0.99247
0.99623
0.99748
0.99811
0.99849

RP
0.98733
0.98942
0.95958
0.91541
0.86327
0.80916
0.61382
0.55831
0.61186
0.66790
0.71360
0.83588
0.91298
0.94095
0.95533
0.96409
0.98187
0.99089
0.99392
0.99543
0.99635

K= 6.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99701
0.98829
0.95711
0.91570
0.87337
0.83620
0.75634
0.79169
0.83853
0.87071
0.89286
0.94312
0.97087
0.98044
0.98528
0.98820
0.99408
0.99703
0.99802
0.99852
0.99881

RS
0.99802
0.99219
0.97128
0.94333
0.91459
0.88932
0.83748
0.86712
0.89965
0.92083
0.93500
0.96613
0.98281
0.98850
0.99136
0.99308
0.99653
0.99826
0.99884
0.99913
0.99931

RP
0.99600
0.98439
0.94294
0.88807
0.83215
0.78307
0.67520
0.71627
0.77741
0.82060
0.85073
0.92011
0.95892
0.97239
0.97921
0.98333
0.99163
0.99580
0.99720
0.99790
0.99832

K= 8.0

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
0.99605
0.98471
0.94707
0.90347
0.86596

RS
0.99739
0.98980
0.96461
0.93539
0.91039

RP
0.99470
0.97962
0.92953
0.87155
0.82153

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.83888
0.81155
0.86380
0.90013
0.92205
0.93631
0.96702
0.98328
0.98881
0.99159
0.99326
0.99662
0.99831
0.99887
0.99915
0.99932

0.89266
0.87836
0.91580
0.93940
0.95316
0.96195
0.98051
0.99017
0.99343
0.99507
0.99605
0.99802
0.99901
0.99934
0.99951
0.99960

0.78509
0.74473
0.81180
0.86086
0.89095
0.91068
0.95352
0.97638
0.98418
0.98811
0.99047
0.99522
0.99761
0.99841
0.99880
0.99904

K= 0.0

N	R	RS	RP
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	0.00000	0.00000	0.00000
2.00000	0.16138	0.32006	0.00269
4.00000	0.35791	0.59752	0.11831
6.00000	0.48370	0.71344	0.25395
8.00000	0.56983	0.77739	0.36226
10.00000	0.63191	0.81797	0.44584
20.00000	0.78720	0.90473	0.66968
40.00000	0.88492	0.95122	0.81863
60.00000	0.92118	0.96721	0.87514
80.00000	0.94007	0.97531	0.90482
100.00000	0.95165	0.98020	0.92311

K= 0.1

N	R	RS	RP
0.01000	0.99998	1.00000	0.99995
0.02000	0.99991	1.00000	0.99982
0.04000	0.99946	0.99965	0.99926
0.06000	0.99878	0.99923	0.99833
0.08000	0.99778	0.99853	0.99702
0.10000	0.99650	0.99766	0.99533
0.20000	0.98543	0.99017	0.98069
0.40000	0.93138	0.95183	0.91094
0.60000	0.78747	0.83841	0.73652
0.80000	0.35661	0.43089	0.28232
1.00000	0.02097	0.03388	0.00807
2.00000	0.16553	0.32682	0.00424
4.00000	0.36143	0.60104	0.12181
6.00000	0.48696	0.71598	0.25793
8.00000	0.57281	0.77940	0.36621
10.00000	0.63462	0.81964	0.44959
20.00000	0.78900	0.90563	0.67237
40.00000	0.88597	0.95169	0.82026
60.00000	0.92192	0.96753	0.87630
80.00000	0.94064	0.97555	0.90572
100.00000	0.95212	0.98039	0.92384

K= 0.2

N	R	RS	RP
0.01000	0.99995	1.00000	0.99991
0.02000	0.99981	1.00000	0.99963
0.04000	0.99891	0.99931	0.99852
0.06000	0.99750	0.99834	0.99666
0.08000	0.99555	0.99704	0.99406

0.10000	0.99300	0.99572	0.99069
0.20000	0.97115	0.98048	0.96182
0.40000	0.86928	0.90714	0.83142
0.60000	0.63826	0.71796	0.55856
0.80000	0.24153	0.32073	0.16234
1.00000	0.06047	0.09910	0.02185
2.00000	0.17750	0.34594	0.00906
4.00000	0.37172	0.61123	0.13221
6.00000	0.49649	0.72334	0.26964
8.00000	0.58150	0.78522	0.37778
10.00000	0.64251	0.82446	0.46057
20.00000	0.79422	0.90824	0.68020
40.00000	0.88901	0.95305	0.82498
60.00000	0.92405	0.96845	0.87965
80.00000	0.94228	0.97625	0.90831
100.00000	0.95345	0.98095	0.92595

K= 0.4

N	R	RS	RD
0.01000	0.99991	1.00000	0.99982
0.02000	0.99963	1.00000	0.99926
0.04000	0.99779	0.99853	0.99704
0.06000	0.99500	0.99667	0.99334
0.08000	0.99111	0.99406	0.98816
0.10000	0.98609	0.99068	0.98149
0.20000	0.94363	0.96167	0.92560
0.40000	0.76616	0.83095	0.70138
0.60000	0.47759	0.58353	0.37164
0.80000	0.22252	0.32095	0.12410
1.00000	0.13515	0.22394	0.04637
2.00000	0.21966	0.40928	0.03004
4.00000	0.40943	0.64684	0.17201
6.00000	0.53121	0.74920	0.31323
8.00000	0.61294	0.80565	0.42023
10.00000	0.67093	0.84137	0.50049
20.00000	0.81274	0.91737	0.70812
40.00000	0.89970	0.95781	0.84160
60.00000	0.93154	0.97167	0.89141
80.00000	0.94804	0.97868	0.91740
100.00000	0.95813	0.98291	0.93336

K= 0.6

N	R	RS	RD
0.01000	0.99986	1.00000	0.99972
0.02000	0.99920	0.99951	0.99889
0.04000	0.99669	0.99782	0.99557
0.06000	0.99253	0.99501	0.99004
0.08000	0.98672	0.99111	0.98233
0.10000	0.97927	0.98610	0.97244
0.20000	0.91779	0.94387	0.89172
0.40000	0.69023	0.77378	0.60669
0.60000	0.41688	0.53631	0.29745
0.80000	0.24995	0.37124	0.12866
1.00000	0.19835	0.32578	0.07091
2.00000	0.27635	0.48561	0.06709
4.00000	0.46243	0.69286	0.23200
6.00000	0.57931	0.78276	0.37586
8.00000	0.65591	0.83214	0.47968
10.00000	0.70937	0.86327	0.55547
20.00000	0.83716	0.92911	0.74521

40.00000
60.00000
80.00000
100.00000

0.91357
0.94120
0.95545
0.96414

0.96390
0.97579
0.98179
98540

0.86325
0.90661
0.92911
0.94287

K= 0.8

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99981
0.99892
0.99559
0.99006
0.98238
0.97257
0.89387
0.63752
0.40022
0.28602
0.25493
0.33882
0.52174
0.63192
0.70209
0.75017
0.86229
0.92759
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RS
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0.94087
0.96997
0.97988
0.98487
0.98788

RP
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R
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RP
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0.99386

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0.85208
0.88559
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0.98761
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RS
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RD
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RS
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0.99502

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0.99667
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0.99800

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4.00000
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8.00000
10.00000
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40.00000
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80.00000
100.00000

R
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0.71656
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0.87063
0.93058
0.95275
0.96421
0.97121
0.98544
0.99268
0.99511
0.99633
0.99706

RS
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0.98062
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0.99414
0.99706
0.99804
0.99853
0.99882

RP
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0.99270
0.97177
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0.85792
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0.58196
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4.00000
6.00000
8.00000
10.00000
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80.00000
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R
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0.90584
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0.79506
0.83197
0.86163
0.88350
0.93644
0.96711
0.97786
0.98332
0.98662
0.99327
0.99663
0.99775
0.99831
0.99865

RS
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0.99461
0.97996
0.95988
0.93858
0.91918
0.87561
0.89621
0.92146
0.93805
0.94917
0.97357
0.98661
0.99104
0.99327
0.99461
0.99730
0.99865
0.99910
0.99932
0.99946

RP
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0.98918
0.95960
0.91831
0.87310
0.82988
0.70263
0.69390
0.74248
0.78521
0.81783
0.89932
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0.08000

R
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0.89693

RS
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0.99294
0.97511
0.95368
0.93455

RP
0.99634
0.98580
0.94928
0.90342
0.85932

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0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

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0.99045
0.99235
0.99616
0.99838
0.99872
0.99904
0.99923

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0.93433
0.95269
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0.97031
0.98481
0.99235
0.99489
0.99616
0.99693
0.99846
0.99923
0.99949
0.99962
0.99969

0.82266
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0.78536
0.83276
0.86583
0.88873
0.94094
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0.97972
0.98474
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0.99387
0.99693
0.99795
0.99846
0.99877

K= 0.0

N	R	RS	RP
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	0.00000	0.00000	0.00000
2.00000	0.23614	0.45620	0.01608
4.00000	0.36569	0.70273	0.02865
6.00000	0.45813	0.79364	0.12263
8.00000	0.53010	0.84172	0.21847
10.00000	0.58653	0.87156	0.30149
20.00000	0.74453	0.93381	0.55526
40.00000	0.85626	0.96637	0.74616
60.00000	0.90012	0.97745	0.82279
80.00000	0.92349	0.98304	0.86395
100.00000	0.93801	0.98641	0.88960

K= 0.1

N	R	RS	RP
0.01000	0.99999	1.00000	0.99997
0.02000	0.99994	1.00000	0.99988
0.04000	0.99977	1.00000	0.99953
0.06000	0.99924	0.99953	0.99895
0.08000	0.99860	0.99908	0.99812
0.10000	0.99779	0.99853	0.99706
0.20000	0.99085	0.99382	0.98788
0.40000	0.95737	0.96994	0.94480
0.60000	0.86988	0.90077	0.83899
0.80000	0.59255	0.64733	0.53778
1.00000	0.07904	0.10324	0.05485
2.00000	0.24020	0.46302	0.01738
4.00000	0.36856	0.70559	0.03153
6.00000	0.46098	0.79559	0.12637
8.00000	0.53286	0.84321	0.22252
10.00000	0.58917	0.87278	0.30557
20.00000	0.74652	0.93444	0.55860
40.00000	0.85752	0.96669	0.74834
60.00000	0.90103	0.97767	0.82439
80.00000	0.92420	0.98321	0.86520
100.00000	0.93859	0.98655	0.89064

K= 0.2

N	R	RS	RP
0.01000	0.99997	1.00000	0.99994
0.02000	0.99988	1.00000	0.99977
0.04000	0.99933	0.99959	0.99907
0.06000	0.99843	0.99897	0.99790
0.08000	0.99719	0.99813	0.99625

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.99559
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0.44452
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0.46931
0.54097
0.59690
0.75231
0.86115
0.90366
0.92626
0.94027

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0.98769
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0.81999
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0.21802
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0.71381
0.80119
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-53-

K = 0.4

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P
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0.98053
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RP
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P
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RS
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R
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RS
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RS
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RD
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60.00000
80.00000
100.00000

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-55-

K = 2.0

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80.00000
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R
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0.98389
0.98708

RS
0.99976
0.99887
0.99539
0.98975
0.98208
0.97261
0.90824
0.79755
0.76964
0.78066
0.80094
0.87829
0.93472
0.95568
0.96648
0.97307
0.98642
0.99318
0.99545
0.99659
0.99727

RP
0.99942
0.99768
0.99078
0.97950
0.96419
0.94527
0.81594
0.56714
0.43715
0.37776
0.35317
0.40259
0.57831
0.68483
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0.79339
0.88990
0.94324
0.96178
0.97119
0.97688

K = 3.0

N
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0.04000
0.06000
0.08000
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0.80000
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4.00000
6.00000
8.00000
10.00000
20.00000

R
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0.98975
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0.96153
0.94260
0.83546
0.70917
0.67726
0.67768
0.68964
0.76985
0.86071
0.90159
0.92415
0.93835
0.96824

RS
0.99959
0.99827
0.99318
0.98508
0.97450
0.96209
0.89497
0.83848
0.84779
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0.88592
0.93584
0.96663
0.97753
0.98308
0.98643
0.99319

RP
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0.99652
0.98632
0.97001
0.94855
0.92311
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0.60386
0.75479
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0.86522
0.89028
0.94329

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80.00000
100.00000

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0.99350

0.99659
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0.99863

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0.98549
0.98837

-56-

K= 4.0

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4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
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0.98654
0.97108
0.95164
0.92989
0.82804
0.74639
0.73896
0.75164
0.76969
0.84622
0.91282
0.93974
0.95404
0.96288
0.98110
0.99047
0.99363
0.99522
0.99617

RS
0.99942
0.99770
0.99107
0.98089
0.96827
0.95441
0.89630
0.87761
0.89652
0.91451
0.92817
0.96131
0.98019
0.98671
0.99000
0.99199
0.99599
0.99799
0.99866
0.99899
0.99920

RP
0.99884
0.99538
0.98202
0.96127
0.93502
0.90537
0.75978
0.61518
0.58141
0.58878
0.61121
0.73113
0.84546
0.89277
0.91808
0.93377
0.96622
0.98295
0.98860
0.99144
0.99314

K= 6.0

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0.04000
0.06000
0.08000
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0.80000
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4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
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0.99487
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0.81197
0.82672
0.84712
0.86573
0.92088
0.95784
0.97140
0.97838
0.98263
0.99124
0.99560
0.99706
0.99780
0.99824

RS
0.99915
0.99659
0.98725
0.97424
0.96014
0.94699
0.91551
0.92845
0.94583
0.95731
0.96500
0.98185
0.99082
0.99386
0.99539
0.99631
0.99815
0.99908
0.99938
0.99954
0.99963

RP
0.99826
0.99314
0.97406
0.94646
0.91471
0.88248
0.76332
0.69548
0.70761
0.73694
0.76646
0.85990
0.92487
0.94894
0.96137
0.96894
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0.99684

K= 8.0

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0.06000
0.08000

R
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0.97560
0.95273
0.92986

RS
0.99888
0.99553
0.98410
0.97002
0.95709

RP
0.99769
0.99098
0.96710
0.93544
0.90264

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.90993
0.86035
0.85974
0.88085
0.89999
0.91491
0.95287
0.97553
0.98352
0.98759
0.99004
0.99500
0.99749
0.99833
0.99874
0.99900

0.94720
0.93610
0.95486
0.96748
0.97488
0.97961
0.98959
0.99476
0.99650
0.99737
0.99790
0.99895
0.99947
0.99965
0.99974
0.99979

0.87266
0.78459
0.76463
0.79421
0.82510
0.85021
0.91615
0.95631
0.97055
0.97780
0.98219
0.99105
0.99551
0.99700
0.99775
0.99820

PHI=80.

-58-

K= 0.0

N	P	RS	RP
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	0.00000	0.00000	0.00000
2.00000	0.42731	0.67008	0.18453
4.00000	0.43156	0.83587	0.02724
6.00000	0.44499	0.88924	0.00075
8.00000	0.47199	0.91622	0.02776
10.00000	0.50311	0.93257	0.07365
20.00000	0.63598	0.96582	0.30613
40.00000	0.77142	0.98278	0.56005
60.00000	0.83445	0.98849	0.68042
80.00000	0.87040	0.99135	0.74945
100.00000	0.89357	0.99308	0.79406

K= 0.1

N	R	RS	RP
0.01000	0.99999	1.00000	0.99999
0.02000	0.99997	1.00000	0.99994
0.04000	0.99989	1.00000	0.99977
0.06000	0.99962	0.99976	0.99949
0.08000	0.99932	0.99955	0.99909
0.10000	0.99893	0.99928	0.99858
0.20000	0.99557	0.99701	0.99413
0.40000	0.97939	0.98546	0.97332
0.60000	0.93689	0.95198	0.92179
0.80000	0.79331	0.82378	0.76284
1.00000	0.29839	0.33369	0.26308
2.00000	0.43060	0.67528	0.18591
4.00000	0.43320	0.83760	0.02879
6.00000	0.44679	0.89034	0.00323
8.00000	0.47399	0.91704	0.03094
10.00000	0.50527	0.93324	0.07730
20.00000	0.63821	0.96616	0.31027
40.00000	0.77317	0.98295	0.56338
60.00000	0.83583	0.98860	0.68305
80.00000	0.87153	0.99144	0.75161
100.00000	0.89452	0.99315	0.79589

K= 0.2

N	R	RS	RP
0.01000	0.99999	1.00000	0.99997
0.02000	0.99994	1.00000	0.99989
0.04000	0.99967	0.99979	0.99955
0.06000	0.99924	0.99950	0.99898
0.08000	0.99864	0.99910	0.99818

0.10000	0.99786	0.99857	0.99715
0.20000	0.99117	0.99403	0.98832
0.40000	0.95960	0.97145	0.94775
0.60000	0.88242	0.91045	0.85438
0.80000	0.68859	0.73801	0.63918
1.00000	0.41025	0.47432	0.34618
2.00000	0.43966	0.68956	0.18977
4.00000	0.43799	0.84257	0.03340
6.00000	0.45208	0.89353	0.01062
8.00000	0.47990	0.91942	0.04038
10.00000	0.51160	0.93514	0.08807
20.00000	0.64475	0.96712	0.32239
40.00000	0.77826	0.98344	0.57308
60.00000	0.83982	0.98893	0.69071
80.00000	0.87478	0.99169	0.75788
100.00000	0.89726	0.99334	0.80117

K= 0.4

N	R	RS	RP
0.01000	0.99997	1.00000	0.99994
0.02000	0.99989	1.00000	0.99977
0.04000	0.99932	0.99955	0.99910
0.06000	0.99847	0.99898	0.99796
0.08000	0.99728	0.99819	0.99638
0.10000	0.99574	0.99715	0.99432
0.20000	0.98255	0.98819	0.97690
0.40000	0.92361	0.94609	0.90113
0.60000	0.80480	0.85338	0.75623
0.80000	0.63155	0.70790	0.55521
1.00000	0.50813	0.61159	0.40467
2.00000	0.46761	0.73282	0.20239
4.00000	0.45554	0.85948	0.05159
6.00000	0.47192	0.91455	0.03929
8.00000	0.50209	0.92768	0.07650
10.00000	0.53530	0.94177	0.12884
20.00000	0.66870	0.97049	0.36691
40.00000	0.79653	0.98514	0.60793
60.00000	0.85402	0.99007	0.71796
80.00000	0.88630	0.99254	0.78006
100.00000	0.90693	0.99403	0.81983

K= 0.6

N	R	RS	RP
0.01000	0.99996	1.00000	0.99992
0.02000	0.99977	0.99988	0.99966
0.04000	0.99899	0.99933	0.99865
0.06000	0.99771	0.99848	0.99697
0.08000	0.99593	0.99728	0.99458
0.10000	0.99363	0.99574	0.99152
0.20000	0.97421	0.98257	0.96585
0.40000	0.89354	0.92542	0.86157
0.60000	0.76266	0.82694	0.69839
0.80000	0.63235	0.72944	0.53527
1.00000	0.55871	0.68882	0.42860
2.00000	0.49856	0.77862	0.21849
4.00000	0.48058	0.88038	0.08079
6.00000	0.50119	0.91846	0.08393
8.00000	0.53473	0.93818	0.13129
10.00000	0.56984	0.95022	0.18945
20.00000	0.70211	0.97479	0.42944

40.00000
60.00000
80.00000
100.00000

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0.87280
0.90142
0.91955

0.98731
0.99152
0.99364
0.99491

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0.80920
0.84420

-60-

K = 0.8

N
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0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
0.99994
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0.99865
0.99695
0.99458
0.99154
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0.86981
0.74301
0.64483
0.59279
0.52751
0.50989
0.53623
0.57339
0.61011
0.73893
0.84696
0.89222
0.91689
0.93239

ES
1.00000
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0.99910
0.99797
0.99638
0.99434
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0.90994
0.81998
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0.74219
0.81825
0.90060
0.93216
0.94857
0.95860
0.97905
0.98947
0.99297
0.99472
0.99577

RD
0.99989
0.99955
0.99819
0.99594
0.99279
0.98874
0.95528
0.82969
0.66605
0.53127
0.44339
0.23678
0.11918
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K = 1.0

N
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0.02000
0.04000
0.06000
0.08000
0.10000
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0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
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0.99831
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0.85202
0.73599
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0.61879
0.55375
0.54125
0.57392
0.61421
0.65180
0.77470
0.87094
0.90990
0.93084
0.94390

RS
1.00000
0.99973
0.99888
0.99747
0.99550
0.99297
0.97229
0.89939
0.82352
0.78617
0.78251
0.85042
0.91810
0.94414
0.95769
0.96595
0.98280
0.99136
0.99423
0.99567
0.99653

RD
0.99986
0.99944
0.99775
0.99493
0.99101
0.98600
0.94527
0.80465
0.64845
0.53284
0.45508
0.25707
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0.20370
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0.89126

K = 1.5

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0.08000

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0.99000

RS
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0.99831
0.99622
0.99333

RD
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0.99915
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0.98666

0.10000
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0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

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0.66614
0.61033
0.62027
0.66604
0.70965
0.74566
0.84728
0.91641
0.94260
0.95631
0.96474

0.98968
0.96177
0.88972
0.84897
0.84284
0.85139
0.90505
0.94882
0.96526
0.97375
0.97891
0.98938
0.99467
0.99644
0.99733
0.99787

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0.92302
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0.63457
0.54532
0.48089
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-61-

K= 2.0

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2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
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0.99664
0.99251
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0.97982
0.92959
0.82146
0.75751
0.72250
0.70023
0.65884
0.60155
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0.97117
0.97680

RS
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0.99945
0.99776
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0.99127
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0.99826
0.99861

RD
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0.99001
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0.97302
0.90502
0.74873
0.63771
0.56209
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K= 3.0

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0.06000
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2.00000
4.00000
6.00000
8.00000
10.00000
20.00000

R
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0.99501
0.98902
0.98107
0.97153
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0.82954
0.78881
0.76510
0.75010
0.73998
0.79780
0.84435
0.87509
0.89613
0.94422

RS
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0.99916
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0.99273
0.98753
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0.93091
0.94056
0.96692
0.98292
0.98853
0.99137
0.99309
0.99653

RD
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0.99334
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80.00000
100.00000

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0.99931

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0.97723

-62-

K= 4.0

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4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
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0.99832
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0.97605
0.96490
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0.84376
0.81373
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0.86326
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0.98850
0.99135
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RS
0.99973
0.99889
0.99566
0.99068
0.98443
0.97750
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0.94636
0.95579
0.96294
0.98017
0.98989
0.99323
0.99491
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0.99796
0.99898
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0.99959

RP
0.99944
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0.75094
0.68111
0.63802
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K= 6.0

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R
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0.99680

RS
0.99959
0.99835
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0.99075
0.99533
0.99688
0.99766
0.99813
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0.99953
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0.99981

RP
0.99916
0.99667
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0.97337
0.95584
0.93933
0.86311
0.77412
0.72992
0.71270
0.71184
0.77272
0.86244
0.90354
0.92605
0.94012
0.96941
0.98456
0.98968
0.99225
0.99379

K= 8.0

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
0.99917
0.99672
0.98799
0.97636
0.96423

RS
0.99945
0.99783
0.99223
0.98523
0.97868

RP
0.99988
0.99561
0.98376
0.96750
0.94979

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

0.95306
0.91712
0.88773
0.87939
0.88156
0.88821
0.92416
0.95745
0.97080
0.97782
0.98214
0.99096
0.99546
0.99697
0.99772
0.99818

0.97357
0.96743
0.97691
0.98338
0.98718
0.98960
0.99470
0.99734
0.99822
0.99867
0.99893
0.99947
0.99973
0.99982
0.99987
0.99989

0.93256
0.84482
0.79855
0.77540
0.77595
0.78682
0.85361
0.91757
0.94337
0.95698
0.96535
0.98246
0.99118
0.99411
0.99558
0.99646

PHI=90.

-64-

K= 0.0

N	R	RS	RD
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	1.00000	1.00000	1.00000
2.00000	0.99999	1.00000	0.99999
4.00000	0.99999	1.00000	0.99998
6.00000	0.99998	1.00000	0.99997
8.00000	0.99998	1.00000	0.99996
10.00000	0.99997	1.00000	0.99995
20.00000	0.99995	1.00000	0.99990
40.00000	0.99990	1.00000	0.99980
60.00000	0.99985	1.00000	0.99970
80.00000	0.99980	1.00000	0.99959
100.00000	0.99975	1.00000	0.99949

K= 0.1

N	R	RS	RD
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	0.99999	0.99999	0.99999
2.00000	0.99999	1.00000	0.99999
4.00000	0.99999	1.00000	0.99998
6.00000	0.99998	1.00000	0.99997
8.00000	0.99998	1.00000	0.99996
10.00000	0.99997	1.00000	0.99995
20.00000	0.99995	1.00000	0.99990
40.00000	0.99990	1.00000	0.99980
60.00000	0.99985	1.00000	0.99970
80.00000	0.99980	1.00000	0.99959
100.00000	0.99975	1.00000	0.99949

K= 0.2

N	R	RS	RD
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000

0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	0.99999	0.99999	0.99999
2.00000	0.99999	1.00000	0.99999
4.00000	0.99999	1.00000	0.99998
6.00000	0.99998	1.00000	0.99997
8.00000	0.99998	1.00000	0.99996
10.00000	0.99997	1.00000	0.99995
20.00000	0.99995	1.00000	0.99990
40.00000	0.99990	1.00000	0.99980
60.00000	0.99985	1.00000	0.99970
80.00000	0.99980	1.00000	0.99959
100.00000	0.99975	1.00000	0.99949

K = 0.4

N	R	RS	RP
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	0.99999	1.00000	0.99999
2.00000	0.99999	1.00000	0.99999
4.00000	0.99999	1.00000	0.99998
6.00000	0.99998	1.00000	0.99997
8.00000	0.99998	1.00000	0.99996
10.00000	0.99997	1.00000	0.99995
20.00000	0.99995	1.00000	0.99990
40.00000	0.99990	1.00000	0.99980
60.00000	0.99985	1.00000	0.99970
80.00000	0.99980	1.00000	0.99959
100.00000	0.99975	1.00000	0.99949

K = 0.6

N	R	RS	RP
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	1.00000	1.00000	0.99999
2.00000	0.99999	1.00000	0.99999
4.00000	0.99999	1.00000	0.99998
6.00000	0.99998	1.00000	0.99997
8.00000	0.99998	1.00000	0.99996
10.00000	0.99997	1.00000	0.99995
20.00000	0.99995	1.00000	0.99990

40.00000
60.00000
80.00000
100.00000

0.99990
0.99985
0.99980
0.99975

1.00000
1.00000
1.00000
1.00000

0.99980
0.99970
0.99959
0.99949

-66-

K = 0.8

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
0.99999
0.99999
0.99998
0.99998
0.99997
0.99995
0.99990
0.99985
0.99980
0.99975

RS
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000

RP
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
0.99999
0.99999
0.99999
0.99998
0.99997
0.99996
0.99995
0.99990
0.99980
0.99970
0.99959
0.99949

K = 1.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
0.99999
0.99999
0.99998
0.99998
0.99997
0.99995
0.99990
0.99985
0.99980
0.99975

RS
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000

RP
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
0.99999
0.99999
0.99998
0.99997
0.99996
0.99995
0.99990
0.99980
0.99970
0.99959
0.99949

K = 1.5

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
1.00000
1.00000
1.00000
1.00000
1.00000

RS
1.00000
1.00000
1.00000
1.00000
1.00000

RP
1.00000
1.00000
1.00000
1.00000
1.00000

0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	1.00000	1.00000	1.00000
2.00000	0.99999	1.00000	0.99999
4.00000	0.99999	1.00000	0.99999
6.00000	0.99998	1.00000	0.99997
8.00000	0.99998	1.00000	0.99996
10.00000	0.99997	1.00000	0.99995
20.00000	0.99995	1.00000	0.99990
40.00000	0.99990	1.00000	0.99980
60.00000	0.99985	1.00000	0.99970
80.00000	0.99980	1.00000	0.99959
100.00000	0.99975	1.00000	0.99949

K= 2.0

N	R	RS	RP
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	1.00000	1.00000	0.99999
2.00000	0.99999	1.00000	0.99999
4.00000	0.99999	1.00000	0.99998
6.00000	0.99998	1.00000	0.99997
8.00000	0.99998	1.00000	0.99996
10.00000	0.99997	1.00000	0.99995
20.00000	0.99995	1.00000	0.99990
40.00000	0.99990	1.00000	0.99980
60.00000	0.99985	1.00000	0.99970
80.00000	0.99980	1.00000	0.99959
100.00000	0.99975	1.00000	0.99949

K= 3.0

N	R	RS	RP
0.01000	1.00000	1.00000	1.00000
0.02000	1.00000	1.00000	1.00000
0.04000	1.00000	1.00000	1.00000
0.06000	1.00000	1.00000	1.00000
0.08000	1.00000	1.00000	1.00000
0.10000	1.00000	1.00000	1.00000
0.20000	1.00000	1.00000	1.00000
0.40000	1.00000	1.00000	1.00000
0.60000	1.00000	1.00000	1.00000
0.80000	1.00000	1.00000	1.00000
1.00000	1.00000	1.00000	1.00000
2.00000	0.99999	1.00000	0.99999
4.00000	0.99999	1.00000	0.99998
6.00000	0.99999	1.00000	0.99997
8.00000	0.99998	1.00000	0.99996
10.00000	0.99997	1.00000	0.99995
20.00000	0.99995	1.00000	0.99990

40.00000
60.00000
80.00000
100.00000

0.99990
0.99985
0.99980
0.99975

1.00000
1.00000
1.00000
1.00000

0.99980
0.99970
0.99959
0.99949

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K = 4.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
0.99999
0.99999
0.99999
0.99998
0.99997
0.99995
0.99990
0.99985
0.99980
0.99975

PS
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
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1.00000
1.00000
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1.00000

RP
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
0.99999
0.99999
0.99998
0.99997
0.99996
0.99995
0.99990
0.99980
0.99970
0.99960
0.99949

K = 6.0

N
0.01000
0.02000
0.04000
0.06000
0.08000
0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

R
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
0.99999
0.99999
0.99998
0.99998
0.99997
0.99995
0.99990
0.99985
0.99980
0.99975

PS
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
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1.00000
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1.00000
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1.00000

RP
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
1.00000
0.99999
0.99999
0.99998
0.99997
0.99996
0.99995
0.99990
0.99980
0.99970
0.99959
0.99949

K = 8.0

N
0.01000
0.02000
0.04000
0.06000
0.08000

R
1.00000
1.00000
1.00000
1.00000
1.00000

PS
1.00000
1.00000
1.00000
1.00000
1.00000

RP
1.00000
1.00000
1.00000
1.00000
1.00000

0.10000
0.20000
0.40000
0.60000
0.80000
1.00000
2.00000
4.00000
6.00000
8.00000
10.00000
20.00000
40.00000
60.00000
80.00000
100.00000

1.00000
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1.00000
1.00000
0.99999
0.99999
0.99998
0.99998
0.99997
0.99995
0.99990
0.99985
0.99980
0.99975

1.00000
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1.00000
0.99999
0.99999
0.99998
0.99997
0.99996
0.99995
0.99990
0.99980
0.99970
0.99959
0.99949